Knowledge Management in Higher Education:

A Case Study Using a Stakeholder Approach

A project submitted to Middlesex University in partial fulfillment of the requirements for the degree of Doctor of Professional Studies

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Abstract

Provided that valuable knowledge is: collected from all existing sources including people, systems, databases, file cabinets, etc.; it is stored, categorized and organized; and it is disseminated to those people and systems that need it; *"The right knowledge would reach the right person or system at the right time*" (Seiner, 2000) and businesses would be transformed into knowledge organizations and economies into knowledge economies. This is in fact the global business phenomenon of our modern world economy (Malhotra, 2003); or at least we aspire that it will be. The wealth of today's businesses and modern nations lies on their competences and capabilities as knowledge-based economies (Boisot, 1998).

Higher Education Institutions (HEI) are increasingly exposed to marketplace pressures, in a similar way to other businesses, and the environment in which they are operating today has also changed drastically (Kara & DeShields, 2004), (Cranfield & Taylor, 2008); they experience intense pressure and are required to respond to the global integration (Blose, et al., 2005). The strategic management of knowledge of a university may provide the competitive advantage that universities need and has potentially several benefits to offer to higher education in general. Knowledge Management (KM) which includes management strategies, and methods, as well as the necessary information and communication technologies may potentially leverage intellectual capital and know-how in order that businesses can benefit from gains in human performance and competitiveness. Examples and best practices are available in the literature but very few of them are specific to higher education and involve the use of KM by HEIs. Amongst those who believe that KM has a lot more to offer to Higher Education (HE) is Rowley (Rowley, 2000) who said that "we are a long way from a scenario in which each member of the university community has access to the combined knowledge and wisdom of others in the organization, and has access to that knowledge in a form that suits their particular needs".

This study was initiated to study KM practices in a HEI and create a case study of a KM implementation specific to a HEI following a stakeholder approach. The HEI under study is the largest (over 5,000 students) private HE institution in Cyprus. While involving all areas required for the successful introduction of KM in a HEI, the study delivers a KM solution to satisfy the need of internal stakeholders, being the administration, faculty and staff members and the students. All aspects of KM are examined in the study which being exploratory in nature carries out an organization-wide survey to explore the HEI's stakeholders' perceptions of the "knowledge organization", their current practices including strategy, leadership style, and culture and their needs and expectations relating to KM. Research objectives are satisfied with the utilization of focus groups and surveys conducted via questionnaires and personal interviews for the collection of both quantitative and qualitative data. As data are analyzed the results and recommended

actions lead to a case study which describes the implementation of a kick-off KM project in the HEI. The case study has an explanatory nature and takes the reader through all of the steps, from the initiation to the completion, of the KM project. It may be replicated, customized, and re-used as necessary for other KM implementations in the HEI under study, other HEIs, or other organizations with similar needs.

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I do not just want to thank but I would like to believe that I can return some of the love and care that I have been getting throughout my life from my dearest mother and father. I miss my father who is no longer with me but I can still feel his love and I will forever be encouraged to reach higher because his most valuable inheritance was a strong belief in humankind potentials which put one on a road of hard work, zeal, and dedication which ends with the achievement of one's goals and immediately begins with the setting of new ones.

Thank you!

I dedicate my thesis to my beloved family.

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Acronyms and Abbreviations

CM – Content Management

CMS – Content Management System

DM – Document Management

DMS – Document Management System

HE – Higher Education

HEI – Higher Education Institution

IT – Information Technology

ICT – Information and Communication Technology

KM – Knowledge Management

KMS – Knowledge Management System

KSC – Knowledge Steering Committee

UNic –University of Nicosia

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THESIS STRUCTURE

The research is presented in this document in four sections.

Section I: Introduction and Context of the Research Study, includes:

Chapter 1 – Introduction of Research Rationale and Context, and

Chapter 2 – Knowledge; the Most Valuable Business Asset!?

Chapter 3 – Knowledge Management in Higher Education

This section provides an introduction to the research problem and the nature of the study and discusses the rationale, aims and objectives of the research; presents and discusses the current literature relevant to the research and the field of Knowledge Management; and presents and examines a more focused review of available literature relevant to KM and Higher Education.

Section II – The Research Methodology, Data Collection, and Analysis includes:

Chapter 4 – Research Methodology; Plan and Execution

Chapter 5 – Research Findings, Analysis and Discussion

This section sets out the research design chosen; presents the data analysis for the quantitative data collected from the survey distributed to all members of the HEI and the smaller survey distributed between students of the HEI; and presents the analysis of the qualitative data collected from the focus groups of staff and faculty and the meetings held with top executives of the HEI.

Section III – Conclusions and Recommendations, includes:

Chapter 6 – Reflection on Findings; Recommendations

Chapter 7 – The Case Study

This section reflects on research findings and includes recommendations for short, medium and long terms actions; and presents a KM use-case with the title “Knowledge Management in a Higher Education Institution: A Case Study”, which materializes findings of the previous steps.

Section IV – Self-Reflections, includes:

Chapter 8 – Self-Reflection on DPS Level 5 Descriptors and Learning Outcomes

This section reflects on my achievements throughout the research journey.

Section V – Appendices, includes all of the appendices which provide evidentiary aspects of the research conducted as well as supporting material.

Figure 1 provides a graphical overview of the study.

SECTION I: Introduction and Context of the Research Study

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SECTION III: Conclusions and Recommendations

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Figure 1. Overview of the Research Study

Section I

Introduction and Context of the Research Study

Chapter 1 – Introduction of Research Rationale and Context

Chapter 2 – Knowledge; The Most Valuable Business Asset!?

Chapter 3 – Knowledge Management in Higher Education

[1]

Introduction of Research Rationale and Context

This chapter provides an introduction to the research problem and the nature of the study and discusses the rationale, aims and objectives of the research study.

"Who knows useful things, not many things, is wise." -- Aeschylus

CHAPTER 1: INTRODUCTION OF RESEARCH RATIONALE AND CONTEXT

1.1. Introduction

Businesses competing in today's business world must be equipped with state-of-the-art technologies and must utilize them in the most effective and efficient ways to reach powerful winning decisions. Such decisions will enable them to achieve their strategic short-term to long-term business plans. The advancements made mostly in information and communication technologies and all of the thereafter computer-enabled functionality redefined the ways in which businesses are formed and the way they function and compete both in local and global business and economic environments. The emerged e-world is becoming predominant in the business world and many other aspects of our life. Companies must innovate or die, and their ability to learn, adapt and change becomes a core competency for survival (Rowley, 2000). Technology, globalisation and the emerging knowledge economy are creating a revolution that is urging organizations to seek new ways to reinvent themselves.

Higher education institutions (HEI) are increasingly exposed to marketplace pressures, in a similar way to other businesses, and the environment in which they are operating today has also changed drastically (Kara & DeShields, 2004), (Cranfield & Taylor, 2008) due to several trends and changes, some specific to higher education (HE) and some not, some local but most global. To mention just a few, the expansion in the size of the student population, the increasing competitive nature of HE and the greater expectations and demands of the various stakeholders of HEI, particularly of the students (Iacovidou, 2009) (Becket & Brooks, 2006), (Sahney, et al., 2004) along with the rapid expansion of colleges and universities worldwide as well as the significant increases in the education cost synthesize the competing environment of HEIs. Such an environment is at large market-oriented (Sahney, et al., 2004) with HEIs engaged in a battle of forces with their competition (Becket & Brooks, 2006). Due to globalization which involves worldwide market integration via the movement of goods, capital, labour, and ideas and highlights the dominance of a knowledge economy which is comprised of science-based and information-rich industries (Powell & Snellman, 2004), HEIs experience intense pressure and are required to respond to this global integration (Blose, et al., 2005).

Managing service firms is different from managing other firms (Bowen & Ford, 2002). Knowledge is the key element in competitive differentiation, even more relevant than money, especially in the service industry, like banks, consultants or information technology providers (Gratton & Ghoshal, 2003) and why not HEI. The wealth of today's businesses and modern nations lies on their competences and capabilities as knowledge-based economies. Within this context,

knowledge assets (aka intellectual capital), are defined as "stocks of knowledge from which services are expected to flow for a period of time that may be hard to specify in advance" (Boisot, 1998, p. 3). The management of such knowledge brings "Knowledge Management" in view.

Knowledge Management (KM) is concerned with the exploitation and development of the knowledge assets of an organization with a view to furthering the organization's objectives (Davenport & Hansen, 1999). The significance of KM for knowledge-based economies is undisputable. As a concept, KM involves an enterprise gathering, organizing, sharing, and analyzing the knowledge of individuals and groups across the organization in ways that directly affect performance. It is about helping people communicate and share information. KM includes a collection of processes that govern the creation, dissemination, and utilization of new and existing knowledge (Newman, 1991). Ultimately, KM envisions getting the right information, in the right context, to the right person, at the right time, for the right business purpose (Seiner, 2000).

Knowledge[1] is collected from all existing sources including people, systems, databases, file cabinets and desktops. All knowledge of value is stored and categorized as data in an organized repository. This knowledge can be immediately conveyed to those people and systems that need it, by utilizing the most appropriate every time IT such as an enterprise portal, collaboration tool, or other IT embedded in a knowledge transfer process. The right knowledge will go to the right person or system at the right time. Current knowledge can be retrieved from the system's archives at any time in the future. Though there is usually long-time usefulness of knowledge assets, as knowledge becomes obsolete or expires, that knowledge can automatically be removed from the system (Finneran, 1999). Businesses that consider investing in Knowledge Management as well as those already using it should be able to measure these intangible assets. Therefore, several potential models for measurement of knowledge assets exist (Malhotra, 2003).

Knowledge management is an area with a very broad scope in a business setup as it involves and affects almost all the aspects in a business's operations. It deals with the organizational structure, strategy and leadership, technological infrastructure, culture, an understanding of the particular organizational processes, and it requires measurement and close follow up over a longer period of time. In this perspective, knowledge management is like a jigsaw puzzle made of several pieces which are all required and must be put together in a specific way for the puzzle to be solved. Knowledge Management encompasses management strategies, methods, and technology for leveraging intellectual capital and know-how to achieve gains in human performance and competitiveness (Gartner Group, 1996).

[1] In a chain of information flow, *data* are raw facts, *information* is facts with context and perspective and *knowledge* is information put into productive use (Kakabadse, et al., 2003) (Suresh, 2002).

KM, as it is practiced today, is a system of technologies focused upon the delivery of strategically useful knowledge and expertise the availability of which facilitates effective collaboration and timely decision-making (Villegas, 2001). Such technologies include: Intranets, Extranets, a Data Warehouse, Document Management, Groupware, Decision Support Systems, Web-conferencing, Project Management, Work flow, and more. An organization should practice KM as the process of continually discovering what the organization knows, continually increasing what the organization knows, and continually organizing and disseminating this knowledge for use throughout the organization.

Research took place in the service sector because of the relevancy that knowledge management and intellectual capital have within the sector (Stewart, 1998), (Starbuck, 2002). Consultancy businesses such as McKinsey and Co, Ernst & Young, Coopers & Lybrand and others have long recognized the importance of their intellectual capital to their success, and their intensive, extensive, and pioneering practices of knowledge management led some even to the launch of universities (Rowley, 2000). A study by Curado (Curado, 2008) on KM practices in the Portuguese banking industry found that banks' directors value the exploitation of knowledge more than its exploration; they attribute on average 34% of bank results to KM and 55% of bank results to intellectual capital even though, there may not exist a Chief Knowledge Manager or Intellectual Capital Manager position and no specialized reports documenting evidence and progress made in relation to KM or intellectual capital. Empirical results also exist for a large sample of German firms which confirm that large firms in knowledge-intensive industries with a continuous and consumer-oriented innovation strategy are particularly likely to employ a strategy for KM (Cantner, et al., 2009). More businesses in different business sectors are also practicing KM to some extent (Davenport, et al., 1998), (Ruggles, 1998), (Forrester, 2000).

At this point that competition in the HE sector has risen high, KM, by itself or along with other measures, presents HEIs with an opportunity and a challenge in an effort made to increase their efficiency and productivity. Investigating KM practices in HEIs, Rowley (Rowley, 2000) was claiming a few years ago that significant progress was made in the areas of knowledge access and the creation of knowledge repositories, but not enough progress in the creation of a knowledge environment, and the recognition of knowledge as intellectual capital. More recently Cranfield and Taylor (Cranfield & Taylor, 2008) studying KM in UK HEIs, reported a significant level of KM activities (57%) and concluded that KM is in the process of establishing itself as a new aspect of management, capturing the attention of the HEIs. Some KM activity in HEIs in other countries is also described by other researchers (Arntzen, et al., 2009), (Thai Office of the Higher Education Commission, 2008), (Metaxiotis & Psarras, 2003).

The Higher Education Funding Council for England (HEFCE, 2009) suggests that notwithstanding the traditional roles of HE in research and teaching, knowledge should be built upon and shared, skills should be developed, and social mobility, innovation and enterprise should be enabled through it. Within the HEI itself the development of a KM environment would allow each member of the university community to have access to the combined knowledge and wisdom of others in the organization in a form that suits their particular needs. It is of utmost importance for HEIs in order that they become competitive that they gather together all their weapons starting with no other than their valuable knowledge force, their faculty and staff. They need to empower their employees with processes and tools that will increase their efficiency and productivity. Being in the knowledge sector themselves they should leverage knowledge to their secret weapon and must learn to rely on knowledge for their survival and success.

HEIs disseminate knowledge to the broad public via their offered courses. They also generate new knowledge via the research activities of their faculty, which they disseminate in the form of journal publications, conference proceedings, and other output, which exist as knowledge repositories owned by private and public organizations. In that aspect, HEIs have been, and always will be, keepers and creators of knowledge (Birgeneau, 2005). The utilization of existing and newly-generated knowledge within the institution itself is not usually included in the HEI's objectives and thus, no strategy is devised or implemented to enforce such plan. In fact, HEIs are a long way from the day that each of their members will have access to the combined knowledge and wisdom of others in the organization (Rowley, 2000). The emergence of online databases to which most libraries in HEIs give access to, the collaboration of libraries for the creation of a national library network e.g. eLib, the creation of other academic networks such as SuperJANET in the UK, or larger networks such as LinkedIn which claims to be the World's Largest Professional Network, the secondary contribution of social networks, the contribution by academic publishers etc., all together synthesize a large knowledge pool with broad and elaborated networking and access capabilities.

Efforts such as the above are commendable but they cannot replace the need for internal KM within HEIs as this would allow for the utilization of knowledge possessed by the stakeholders of the HEI in an effort to become more competitive. Competitiveness will come from an effective use of knowledge which implies an ability to understand and learn things in an intelligent way. Understanding the specifics of a concept/situation and the ways necessary to handle it will reveal the need for appropriate knowledge which may be obtained from educational and experiential processes. Within a HEI the efficient organization and management of the wealth of knowledge available by the academic force in ways that would make it easy to use, manipulate, extract, and synthesize, will also support the organization in its collaborations and may work for the sake of the whole academic community which includes students and the academia and in some cases

members of the public community. Knowledge assets have strategic importance to all organizations and must be accounted for and valued accordingly.

1.2. Reason for the Research

The Higher Education sector in Cyprus consists of colleges and universities ranging in size, mission, history, and subject mix. Currently, there are three public, four private universities and some smaller colleges. Also, there are in operation local campuses of some European (mostly UK) universities. The private universities were given an initial license for operation in October 2007; before that time they were operating as colleges for a number of years. The Ministry of Education is the main regulator of the HE sector performing evaluations and offering accreditation to institutions and their programmes of study.

The University of Nicosia (UNic), former "Intercollege" was founded in 1980 as a small college preparing students mostly for professional examinations of recognized British professional bodies such as the Chartered Institute of Marketing. Since then is has undergone tremendous changes and development in all of the areas of operation, including programs offered and student population, organization size (administration, staff, and faculty numbers), buildings and facilities. It is now the largest private university in Cyprus with a student population of over 5,000 students not including distance learning students.

Since 1992 I have been employed as a full-time faculty member in the Department of Computer Science of the School of Sciences and Engineering of the University of Nicosia in Cyprus. Before that time I was a student at Intercollege working at the same time from different posts. I have for several years been servicing my department as the Computer Science Program Coordinator and have also been involved with other administrative duties such as academic student advising, final year project student coordination, and registration of school students into their programs and courses of study and more. I have also serviced in a number of committees including being a member of the Senate. I therefore consider that I have very good spherical knowledge of how the institution is functioning both in terms of academic as well as administrative unit operations. Additionally, I have offered IT consultancy and software engineering services to both Intercollege (the predecessor of UNic) in the development of its first student management system, and other businesses seeking the benefits of IT utilization in their business operations.

In the number of years of my service at UNic I have witnessed the changes that this institution has been undergoing from its first years of operation and since then. The changes have been significant and the expansion even more remarkable.

One of the advantages of being small is that it is easy to manage the employee force, coordinate all activities, collaborate with each other, and work together. Actually the comment of the

colleagues who have been with the institution for a while is that **"It was different back then; we all knew each other and worked together as a team. Now, everyone is isolated. We do not anymore know what each one is doing."** This is not just about employee relations or creating a good environment at work. It is also about collaboration, sharing knowledge, one benefiting from the work and knowledge of others and from collaborating and working with others, and the organization benefiting from all of these together. In fact, there may be some collaboration between faculties of the same department and sometimes between those of the same school. But beyond that level links become very difficult to maintain.

My extensive work with the institution made me aware of several limitations/weaknesses which related to the utilization of knowledge and this triggered my desire to investigate this concept. A few examples of such weaknesses/limitations are briefly explained below:

A. The first source for any kind of document for staff, administration, and faculties was the email server. So, if one suspected or remembered that a certain document has been circulated via email would look for it there. This ultimately meant that documents would be stored over and over again by the many recipients either in organized folders on local PC storage or on the email server as part of the original mail. Besides the generated waste and thus inefficient use of technological resources this let to inefficient time management on behalf of the employees who would definitely need more time to locate the document within an increasing volume of documents with a high chance of not being able to find it if they deleted it as "not important" at the time of receipt. Furthermore, a number of documents such as those describing academic decisions and regulations or course syllabi or other may be updated several times. This is an added difficult for the maintenance of accurate, up-to-date records and in an organization which operates in the way described above it adds a risk associated to the retrieval and use of inaccurate sources.
B. There was in many cases lack of sharing, between faculties, of knowledge on their respective areas of expertise even within smaller departments. This may cause: inefficient and insufficient exploitation of research collaboration opportunities between faculties, insufficient guidance and mentoring offered to new recruits who end up creating more and more teaching material instead of customizing and improving the existing material, unfilled gaps of knowledge of interest to faculties teaching different courses of a certain program of study.
C. Communication and collaboration of staff members of different departments was suffering greatly as there is no intranet available for the staff and the administration and the faculty intranet requires a major re-working.

It was obvious to me as a computer scientist and an MIS consultant that information and communication technologies (ICT) could definitely enable the institution to achieve a higher level of efficiency not only in relation to the above situations which are cited here as examples but in many of its areas of operation. It was also apparent to me from the beginning that albeit the institution seemed to be behind in the use of modern ICTs, more than a technological solution was required. Though ICT may enable storage, organization, and retrieval of any required content, the processes which will incorporate the use of the technology, the culture and daily employee practices, and the support and motivation of top level management, all need to be closely considered and worked on as necessary for the changes to be successful.

At first I shared my thoughts with some of my colleagues who agreed with my observations and then I decided to bring my concerns to the HEI's management. We agreed that the issue was worth to be considered further and I happily accepted the duty to pursue further research in the form of a consultancy project which would examine and propose the use of modern ICT principles and practices to enable the institution to achieve higher levels of efficiency and improve its services. As an insider researcher I had a head start over any other external expert since I had a very good knowledge of the organization and its operations and immediate access to any information deemed necessary for the project. I also had considerable expertise in the application of ICT in the business. Such a project was best served by the purpose and content of a work-based professional doctorate and the stakeholder approach seemed as most appropriate.

Approaching the situation as a study specific to a KM implementation was not at all pre-decided. Prior research which I conducted in the areas of Document and Content Management (DM, CM) let to an exploration of KM and its benefits during the study. This expanded my understanding of the organizational problems and opportunities and let me to the realization that many of the existing problems could be attributed to the lack of KM. Throughout its current practices the HEI seemed to be ignoring and not utilizing the knowledge possessed by its employee force and had not at all explored its potentials. The opportunity to employ KM was therefore apparent and could be expected to yield potential benefits.

My interest and research was directed towards Knowledge Management within Higher Education, particularly addressing contributing factors that hindered or promoted the use of KM principles by HEIs, implementation approaches and methodologies, and best practices within the context of HE. The literature revealed a vast number of articles on KM. However, the literature on KM as applied in the HE sector was considerably deficient. Thus, although the literature review was conclusive about the benefits resulting from KM yet the degree of application of KM in HEIs was limited. This intrigued my interest in this project further and increased my motivation to

undertake a project that would assist my employer HEI to achieve greater efficiency via the use of KM.

The project was falling directly within my MIS specialization and my current research interests. As it proved, with the completion of the project, having undertaken this study has allowed me to develop new knowledge and expertise in the area of KM and broadly in the application of ICT in the business and more specifically in the HE sector.

1.3. The Research Problem and Question

In the 21st century HE is being challenged by the knowledge economy, globalization, ubiquitous computing and advances in technology which made the access to knowledge and information open to practically everyone. I was therefore interested to investigate whether HEIs have indeed placed greater emphasis on the role of knowledge and their knowledge assets and subsequently utilized KM at the organizational level to enhance their competitive advantage. Best practices of KM application within HEIs were of particular interest. A review of the literature revealed some limited evidence of implementation and that not at the organizational level, while at the same time existing research suggested clear benefits to each of the areas and functions of the HEI by the application of KM (Kidwell, et al., 2001) (Cranfield & Taylor, 2008). At the same time Stankosky and his doctoral students, Calabrese and Murray, established that KM requires the integration and balancing of leadership, organization, learning and technology in an enterprise-wide setting (Stankosky, 2005).

The availability on one hand of best practices of KM in the service sector and their benefits and the unavailability on the other hand of similar practices in the sector of HE increased my interest as a researcher and urged me to focus my study on the steps necessary for a successful KM implementation in a HEI. I decided to use a stakeholder approach[2] to such an implementation and concentrate on developing a case study of KM implementation specific to a HEI. The work-based nature of the specific study allowed me to cater the implementation to the specific needs of the employer institution. I deemed it necessary to gain an understanding of any currently used KM practices in the HEI and investigate the requirements for the establishment of a positive environment for KM before suggesting its implementation in the institution under study.

This research therefore aspired to create a framework for KM implementation in the HEI under study which would also offer for use by other HEIs. A holistic solution for KM implementation would be examined which would involve a number of business areas which are considered as critical for the success of a KM effort.

[2] A stakeholder approach is a user-centred approach in which all of the stakeholders in an organization are identified and any recommendation made serves to best satisfy the needs and interests of these stakeholders. (Freeman, 1984)

A stakeholders' approach was adopted whereby all internal HE stakeholders were closely consulted and extensively involved in the accomplishment of this research's aim. With the development of this case study I intended to contribute to the existing literature regarding KM use in HE by following through the stepwise introduction of this management tool in a HEI. The research therefore aimed:

- To deliver a holistic solution for a Knowledge Management implementation in a Higher Education Institution.

The characterization of the solution as a holistic solution is made to suggest a spherical solution and not an organization-wide implementation of KM in the HEI.

More specifically, the research aimed to investigate the following:

- The current Knowledge Management practices in the Higher Education Institution under study in order to establish whether KM was being used as a management tool on an organizational level within the HEI, to enhance competitive advantage;
- The perceptions of the HEI's stakeholders of the "Knowledge Organization" along with their needs and perceived opportunities relating to KM;
- Whether factors necessary for the successful implementation of KM in the HEI or factors hindering its effective use were present and make the necessary recommendations to the HEI's management regarding corrective actions;
- The introduction of a KM implementation in the HEI using a stakeholder approach. A stepwise development process was to be followed and details on its implementation would be included in a case study which would be possible to use for future KM implementations either by the existing HEI or other similar institutions wishing to use KM.

1.4. Context and Scope of the Research

This research intended to investigate the utilization of KM as a management tool applied in HE. For the purposes of the research a specific HEI was used. The organizational structure and functioning of the chosen HEI was considered to be typical of HEIs of about the same size or bigger thus, making the knowledge gained in this research and KM application transferable to other HEIs and certain conclusions reached generalizable.

The aim of the study was to create a framework for KM implementation in a HEI using a stakeholder approach. While exploiting all areas required for a successful introduction of KM in a HEI, the study aimed at delivering a KM solution which would satisfy the main stakeholders, i.e., the administration, faculty and staff members. The case study which was constructed outlines a framework for KM implementation in a HEI and presents a suitable methodology for such an

implementation which addresses all of the necessary aspects. Thus, the case examined all of the aspects of KM implementation as outlined by the four pillars set by Stankosky (Stankosky, 2005):

1. Leadership and Management,
2. Organization,
3. Technology, and
4. Learning.

This study had an exploratory nature as it intended to explore the HEI's stakeholders' perceptions of the "knowledge organization", and their current practices including strategy, leadership style, and culture. Further to this exploration, the study made recommendations to the HEI which aim to work towards establishing an environment enabling KM and described principles and practices needed to ensure that individuals may collaborate and share knowledge. Such practices include embedding information and communication technology in the organization workflow. As for the description of the experience of implementing KM in the HEI, an explanatory approach was followed in order that the whole effort and the necessary accompanying explanations would form a detailed case study.

The first part of this research study (exploratory) which investigated the KM practices and a KM-enabling environment in the specific HEI cannot be viewed as a universal truth, thus, the output of the study would not form some law-like generalization. This component of the study was rather based on beliefs, attitudes, and practices of the members of the HEI under study.

The second component of this research study (explanatory) involved examining all the necessary components for a successful KM implementation and suggest such an implementation in a HEI. The KM use-case written at the end could be applicable to other organizations similar to the one under study.

1.5. Research Contribution

This study may be valuable to researchers and practitioners in the area of KM with possible specific interest in its application in HE in the following ways:

a) The study contributes to the body of knowledge about KM enabling factors which include a KM friendly strategy, organizational structure, organizational culture, leadership and management style;
b) Contributes to the body of knowledge about current KM practices in HE;
c) Identifies HE stakeholders' expectations/needs for KM;
d) Provides a case study about a specific KM implementation in a HEI;
e) Provides a holistic KM framework for use in KM implementations in HE and other business sectors.

1.6. Originality and Value

Besides adding to the current literature relating to KM in the HE sector, the challenge and originality of this project laid in the fact that the research would address the concept of applying KM in a HEI in a spherical way looking at all of the related parameters which would be necessary for the success of such a KM effort. Additionally, in terms of the approach which would be followed in the examination of all related aspects, this was a user-centered stakeholder approach as prescribed by modern human-computer interaction principles. Such an approach focuses on usability issues defined by the users who are highly involved in the whole process. This aimed at performing according to the expectations of all stakeholders, while improving the ownership of the Knowledge Management System (KMS). Furthermore, the implementation focused on delivering a KM suggestion whereby all new functionality would be embedded in the current work flow.

Specifically, the project developed a conceptual KM framework and a case study of a specific KM implementation in a HEI. Additionally, it identified and prioritized the actions needed for the implementation of KM at an organizational level in the HEI under study.

The output of this research study will affect the HEI as a whole, if management decides to adopt KM universally as was their original plan. The benefits for the HEI from adopting KM can be multiple including building a competitive advantage for the organization. Within the HEI, employee performance and organization performance can be improved while all of the stakeholders will be enabled in their communication, collaboration, and other coordinated activities and empowered by knowledge sharing.

A successful KMS has the potential to benefit:

- ✓ executive management, by providing them with a powerful decision-support tool;
- ✓ staff, by giving them access to all necessary knowledge, thus, empowering them in their routine and other creative work;
- ✓ faculty, by empowering them both in their teaching and research activities by being able to share valuable knowledge without the need to individually recreate a lot of the knowledge which already exists but instead work on expanding it;
- ✓ students, by giving them access to a plethora of knowledge which will help broaden their horizons and enable learning without spending time to dig for information;
- ✓ the public, by allowing them to use some publicly available knowledge.

1.7. Limitations

The study was conducted based on the following constraints:

In order that a holistic model for KM implementation in HE would be created several aspects affecting KM success had to be considered. These involved studying: a) HEI's KM strategy in accordance to the corporate strategy; b) HEI leadership and management style, organizational structure and culture; c) HEI organizational behavioural aspects and social interactions; d) KM criteria for success (critical success factors) using performance and other metrics. Further to these the development of the KM prototype for the HEI involved studying: a) current KMSs and functionality, and b) constructing the prototype using a stakeholder approach. Finally, these were all written in the form of case study. It is therefore understood that this research involved several different but interrelated disciplines.

The multi-disciplinary nature of KM could possibly be best served by a team of experts each coming from a different field of business and I.T. I completed the gap by studying each aspect of KM up to the degree necessary in order that each requirement was satisfied in the current KM implementation. Some specialized expert advice was also sought when deemed necessary.

The second constraint was that the study did not involve external stakeholders of the HEI i.e., parents, employers, and the general public. Extending the study to include all stakeholders was not possible due to time and money constraints.

1.8. Outline of Dissertation

The research is presented in four sections with an Appendix section used to contain additional and supporting material. Each section has a number of chapters and the thesis includes:

SECTION I: Introduction and Context of the Research Study

- Chapter 1 – Introduction of Research Rationale and Context
- Chapter 2 – Knowledge; The Most Valuable Business Asset!?
- Chapter 3 – Knowledge Management in Higher Education

SECTION II: The Research Methodology, Data Collection, and Analysis

- Chapter 4 – Research Methodology; Plan and Execution
- Chapter 5 – Research Findings, Analysis and Discussion

SECTION III: Conclusions and Recommendations

- Chapter 6 – Reflection on Findings; Recommendations
- Chapter 7 – The Case Study

SECTION IV: Self-Reflections

- Chapter 8 – Self-Reflections on the Research Journey

SECTION V: Appendices

1.9. Conclusion

Chapter 1 has presented the research problem and defined the scope of the research study, its aims and objectives.

Chapter 2 provides a thorough literature review on knowledge, knowledge management and related topics of interest to the present study.

[2]

Knowledge; The Most Valuable Business Asset!?

This chapter presents and discusses the current literature relevant to the research and the field of Knowledge Management.

"Wisdom is the right use of knowledge. To know is not to be wise. To know how to use knowledge is to have wisdom." -- Charles Spurgeon

CHAPTER 2: KNOWLEDGE; THE MOST VALUABLE BUSINESS ASSET!?

2.1. Introduction

This chapter presents and discusses the current literature relevant to the research study in the field of Knowledge Management.

Starting with the introduction of knowledge and its classifications the chapter moves on to the introduction of KM and its benefits, the KM process and frameworks and the presentation of some KM practices. With particular interest on the implementation of KM the chapter examines the critical success factors (enablers) for successful KM and presents ICT-related issues for such an implementation.

2.2. Understanding Knowledge

Albeit, knowledge is a word familiar to everyone, different people interpret it differently and there are therefore many definitions of knowledge. The study of the nature and origin of knowledge is called epistemology, and goes back to the ancient Greek period (Stenmark, 2002).

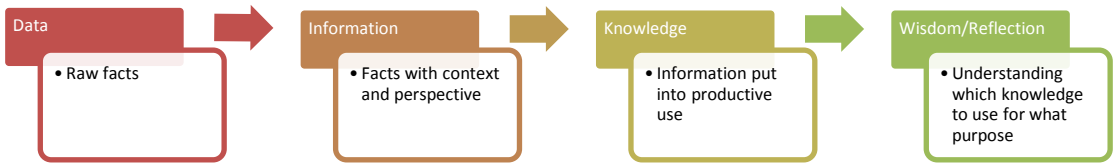


Figure 2. Understanding Knowledge

Many have defined knowledge through time. One way of looking at it is in the context of a chain of information flow (Kakabadse, et al., 2003) (Suresh, 2002), as Figure 2 illustrates. Following is a selection of definitions of knowledge.

Knowledge is:

- *Justified true belief*: Plato first defined the concept of knowledge in his Meno, Phaedo, and Theaetetus (Plato, 1953). This is the definition adopted by many philosophers. It was also used by Nonaka and Takeuchi (Nonaka & Takeuchi, 1995).
- *Information in context*: Knowledge is that which people believe and value on the basis of the meaningful and organized accumulation of information (messages) through experience, communication, inference, perception or cognition (Dretske, 1983) (Lave, 1988).
- *Knowledge is understanding based on experience*: This is an idea that is central to pragmatism and its associated epistemology (James, 1907). It is also a standard definition found in English language dictionaries (Fowler & Flower, 1966).

- *"Knowledge is experience or information that can be communicated or shared."* (Allee, 1997, p. 27)
- *"Knowledge, while made up of data and information, can be thought of as a much greater understanding of a situation, relationships, causal phenomena, and the theories and rules (both explicit and implicit) that underlie a given domain or problem."* (Bennet & Bennet, 2000, p. 19).
- *Knowledge can be thought of as the body of understandings, generalizations, and abstractions that we apply to interpret and manage the world around us.* (Wiig, 1995)
- *"The most essential definition of knowledge is that it is composed of and grounded solely in potential acts and in those signs that refer to them."* (Cavaleri & Reed, 2000, p. 114)
- *"Knowledge is the capacity for effective action."* (Singe, 2002) (Argyris, 1993)
- *"A fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information."* (Davenport & Prusak, 1998, p. 5)

As one may realize from the variety of definitions cited, knowledge is a complex term that can be interpreted in many different ways. It has many different aspects and uses and is viewed by different people from different angles. For the purpose of this study the following definition will be considered.

> *"Knowledge is the fact or condition of knowing something with familiarity gained through experience or association. Knowledge may be recorded in an individual's brain or stored in organizational processes, products, facilities, systems and documents... It involves the ideas or understandings which an entity possesses that are used to take effective action to achieve the entity's goal(s)." Webster's Dictionary*

2.2.1. Knowledge Classification

The most commonly cited classification of knowledge is that of tacit and explicit.

Tacit knowledge refers to knowledge that we have but we cannot clearly express or explain. It is personal, and specific to a context (Nonaka & Takeuchi, 1995). In defining tacit knowledge, Polanyi is remembered by his well-cited quote "we can know more than we can tell" (Polanyi, 1966, p. 4). In such cases, "the knowing is in the doing" (Nickols, 2000, p. 14), as Nickols puts it. Tacit knowledge is difficult to capture and share as it includes insights and intuitions or may relate to an individual's skills and "know-how" of a job acquired over several years of work.

Explicit knowledge is formal and systematic (Nonaka, 1998) and it has been expressed into some written form of text, diagram, or other. Such knowledge is found in manuals, books, and articles and it is therefore easy to capture and share.

Figure 3 is useful in understanding the distinction between the two categories of knowledge. It also cites some examples of the two types.

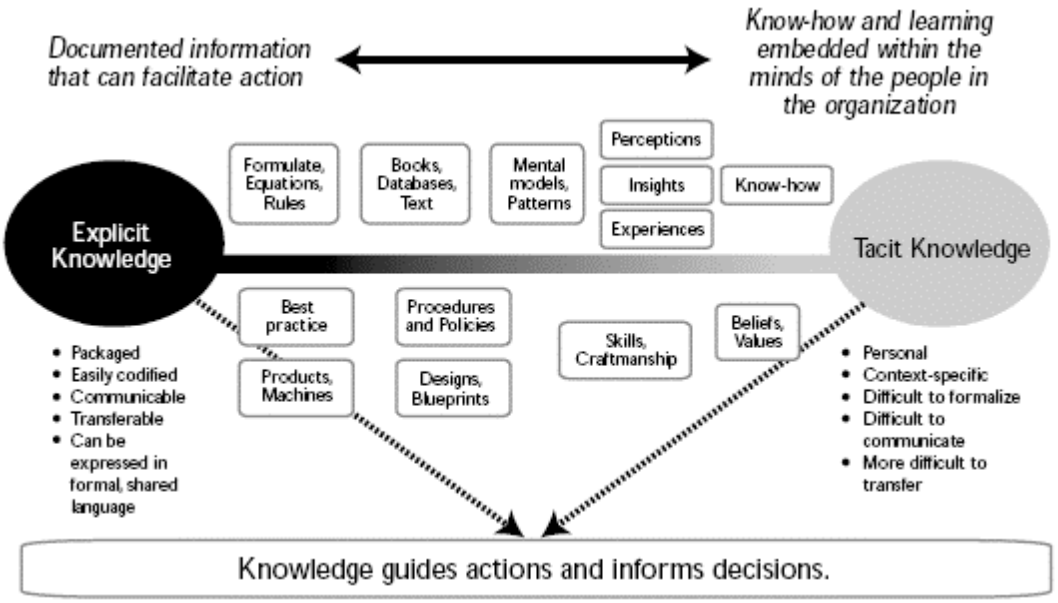


Figure 3. Tacit and Explicit Knowledge; Source: PWC, 2000 in: (Kidwell, et al., 2001)

Nickols makes a note of a third category that of implicit knowledge which he describes as knowledge which can be articulated but it has not (Nickols, 2000). Such knowledge can be deduced from an analysis of observable behaviour or performance or as a result of a study of the direct key-players of an existing system.

Figure 4 depicts the three groups of Nickols graphically (Nickols, 2000).

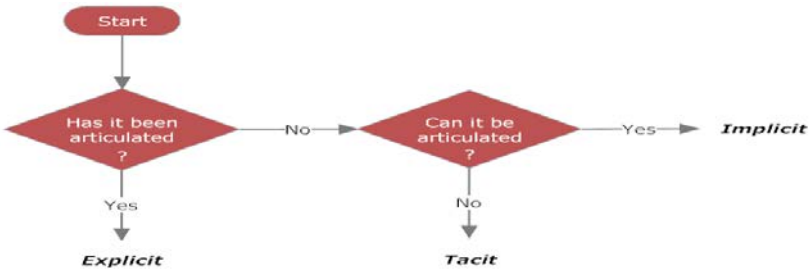


Figure 4. A classification of knowledge; Source: (Nickols, 2000)

Nonaka and his colleagues have recognized the difference between tacit and explicit knowledge as well as the conversion from one type to another and thereby the creation of new knowledge (Nonaka, 1998) (Nonaka & Takeuchi, 1995). The knowledge dimensions are depicted in their SECI model shown in Figure 5 below.

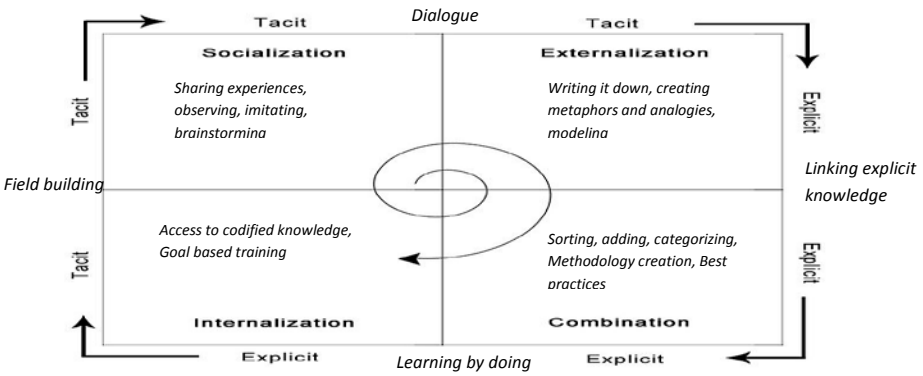


Figure 5. The SECI model of knowledge dimensions; Source: (Nonaka, 1998) (Nonaka & Takeuchi, 1995)

SECI stands for **S**ocialization, **E**xternalization, **C**ombination and **I**nternalization and these correspond to the four modes of knowledge conversion being:

Socialization - Tacit to Tacit. Social interactions, for example meetings, allow for tacit to tacit knowledge transfer by sharing knowledge through experiences, such as spending time together;

Externalization - Tacit to Explicit. Externalization involves publishing or in other ways articulating knowledge in the form of concepts, images, and written documents which make it sharable;

Combination - Explicit to Explicit. Combination is about organizing and integrating knowledge and can be done by combining different types of explicit knowledge, for example building prototypes. Explicit knowledge is collected from inside or outside the organization and then combined, edited or processed to form new knowledge which can then be shared among those concerned;

Internalization - Explicit to Tacit. To internalize knowledge means to receive it and apply it as in learning by doing. This way explicit knowledge becomes part of an individual's knowledge.

The SECI model received criticism from some researchers. In fact, Hildreth and Kimble talk about a flaw in Nonaka's spiral of knowledge. More specifically in the tacit-explicit stage they comment that “if tacit knowledge is inarticulable, this stage simply cannot work” (Hildreth & Kimble, 2002, p. 3). They continue though to recognize that the primary KM approach to managing 'less-structured' knowledge is to try to make tacit knowledge explicit.

Some estimate that only about 5% of the universal knowledge is explicit knowledge, with the remaining 95% being tacit knowledge (Cognitive Design Solutions, 2104) (Figure 6).

Other classifications of knowledge originating from different disciplines of study classify knowledge as: a) Embodied, embedded, embrained, encultured and encoded knowledge (Collins, 1993); b) Formal and informal knowledge (Conklin, 1996); and c)Hard and soft knowledge (Hildeth, et al., 1999).

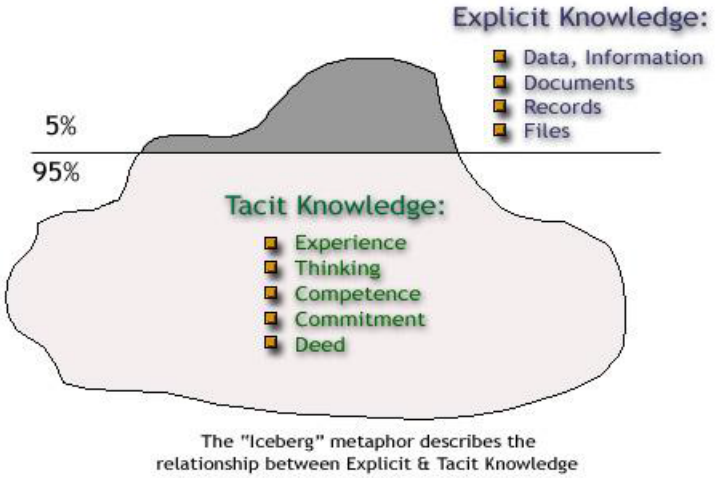


Figure 6. Explicit Vs. Tacit Knowledge; Source: (Cognitive Design Solutions, 2104)

2.3. Knowledge Management (KM)

Some place the birth of KM in the early 1990s when people such as Drucker were stating that the basic economic resource – the means of production – was no longer capital, nor natural resources, nor labour; it was and will be knowledge. (Drucker, 1993)

Knowledge Management, like knowledge itself, is difficult to define. Clearly though it is not a new phenomenon as it is with the management of existing knowledge that an individual, an organization or a society are empowered to achieve new accomplishments. In 1998, Davenport and Prusak were claiming that recognizing knowledge as a corporate asset was fairly new as was the need to value it and manage it effectively (Davenport & Prusak, 1998); but not anymore.

The difficulty in defining KM comes from the fact that different definitions are offered by researchers of different disciplines and backgrounds. Following is a small selection of KM definitions.

- KM is concerned with the exploitation and development of the knowledge assets of an organization with a view to furthering the organization's objectives. (Davenport & Hansen, 1999)
- KM "caters to the critical issues of transitional adaptation, survival and competence in face of increasingly discontinuous environmental change . . . essentially, it embodies organizational processes that seek synergistic combination of data and information processing capacity of information technologies, and the creative and innovative capacity of a human being" (Malhotra, 1998, p. 58). His perception of KM can be summarized by saying that KM should penetrate all areas of a company, and is a vital activity in a strategic organization.

- KM is a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance. (O'Dell, et al., 1998)
- KM is human activity that is part of an ongoing, persistent, purposeful network of interactions among human-based agents through which the participating agents aim at managing other agents, components, and activities participating in the basic knowledge processes in order to produce a planned, directed, unified whole, producing, maintaining, enhancing, acquiring, and transmitting the enterprise's knowledge base. (Firestone, 2001)
- KM is a conceptual framework that encompasses all activities and perspectives required for gaining an overview of creating, dealing with and benefiting from the company's knowledge assets and their particular role in support of the company's business and operations. (Wiig, 1995)
- KM is a composite management of people, processes and information. (Willard, 1999) cited in (Stenmark, 2002)
- KM is much more than managing the flow of information. It means nothing less than setting knowledge free to find its own paths. It means fuelling the creative fire of self-questioning in organizations. Other researchers (Allee, 1997) (Kidwell, et al., 2001) add to this that the challenge in knowledge management is to make the right knowledge available to the right people at the right time.
- KM is a conscious and systematic approach to the capture, retention, and transfer of knowledge. (Bergeron, 2003)

In conclusion, and as Barth puts it, "Put 10 KM experts in a room, and you are likely to get 30 [different] definitions" (Barth, 2000).

A "knowledge asset" is understandably a key term in the study of KM. Synonym terms are: knowledge resources, intellectual capital, human capital, structural capital, customer capital, market capital, etc. What all is actually perceived as a knowledge resource is no other that our knowledge, experiences, education, training, professional networks, collaborative and innovative skills as individuals, groups, organizations, society, nations, the world. Such knowledge assets are the prime factors and resources of production in a knowledge-based economy (Stankosky, 2005).

The awareness of the importance of information and knowledge, along with a growing appreciation for the knowledge level of employees on one hand, and the recognition of the difficulty of dealing with complexity and with an ever increasing competition spurred by technology and the demands of sophisticated customers on the other hand, led to the birth of KM.

Bennet and Bennet describe “knowledge organizations” as organizations which focus on networking and knowledge creation, sharing, and application (Bennet & Bennet, 2003). Such organizations face the ultimate challenge to liberate and amplify the knowledge and creativity of all organizational members.

Knowledge organizations focus on flexibility and customer response rather than organizational stability or the accuracy and repetitiveness of internal processes. They emphasize the promotion of employees’ ideas and capabilities to improve decision-making and organizational effectiveness. They promote team work and use technology to enhance collaboration, employee effectiveness and inclusion in decision-making.

A knowledge organization must, of necessity, become a learning organization so that the entire firm will learn while it works and be able to adapt quickly to market changes and other environmental perturbations (Bennet & Bennet, 2003).

2.3.1. The Need for KM

As the rate of change in technologies exceeds the time to develop subject matter experts, training courses, and human resource interventions (Marler, 1999) the need to speed up knowledge creation and sharing, which is a major goal of KM, becomes essential.

Among the big volume of information an organization creates every day identifying what is useful is a major issue. Notions of the “right knowledge”, the “right people” and the “right time” demonstrate the need to identify the required knowledge, who holds it, and when and how it should be transferred (Duffy, 2000). This is where KM comes in to improve corporate performance by attaining its objectives (Du Plessis, 2007) (Kamara, et al., 2002). The aim of KM is not necessarily to manage all knowledge, but rather to manage just the knowledge that is most important to the organization.

Knowledge is valued as a corporate asset and this becomes apparent in many ways through different common business practices. For example: -when companies prefer to hire experienced people over more educated or intelligent ones or -when most people in organizations consult a few knowledgeable people when they need advice on a particular subject, etc. Also studies showed that managers get two-thirds of their information and knowledge from face-to-face meetings or phone conversations and only one-third from documents (Davenport & Prusak, 2005).

The best way of understanding the need for KM is by appreciating the value of knowledge in today’s rapidly changing and increasingly competitive global economy. Companies face fierce competition which imposes on them pricing pressures and the need to shorten new product introduction and production cycles and to improve overall quality, value, service, innovation, and

speed to market their products. According to Davenport and Prusak the knowledge-based activities of developing products and processes are becoming the primary internal functions of firms and the ones with the greatest potential for providing competitive advantage (Davenport & Prusak, 2005). Additionally, they very importantly point out to the fact that the knowledge advantage is sustainable as it is generating increasing returns and continuing advantages.

Figure 7, which follows offers a simple understanding of the before- and after-KM organization. Individuals portrayed in the figure could also be organizational units which with the use of KM are empowered to work more efficiently by drawing from other's experiences, mistakes, and accomplishments. New hires and existing employees will be able to acquire job knowledge faster, reducing the need for training and increasing job satisfaction and quality.

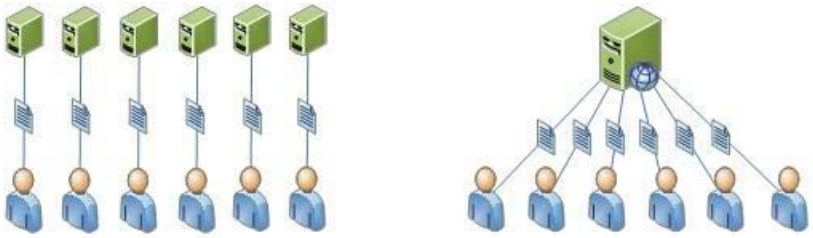


Figure 7. The Before- and After-KM organization; Source: (Website Scripts, 2014)

2.3.2. KM Benefits

A number of studies exist that directly relate knowledge management to organizational performance. For example, McKeen and his co-researchers performed an exploratory investigation of the organizational impact of KM (McKeen, et al., 2006). The investigation involved 90 organizations and examined 12 key KM practices[3]. Their results indicated that the researched KM practices were directly related to organizational performance and this was in turn, directly related to financial performance. It is also interesting to note that the same research found a significant gap between the KM practices that firms believe to be important and those which actually related to organizational performance.

It is a fact that intellectual assets account for the greater portion of value of companies. Surveys reported by Malhotra (Malhotra, 2002) show a 78% total value of the Standard & Poor's 500 (S&P 500), in a survey by PWC, 1998 and an 80% of the GDP is in services, where most output is Knowledge-based.

Also findings from KM industry surveys report the following benefits resulting from KM practices (Malhotra, 2002):

[3] KM practices are "observable organizational activities that are related to knowledge management".

Competitive advantages of KM: "buying patterns, relationships with customers and trading partners, best practices, new research ideas and lots more";

KM contribution to employee performance in: a) managing attention in face of 'info-glut'[4]; b) search and retrieval technologies; c) reduced search time and expenses; d) improved quality of decisions; e) repositories of 'corporate memories'; and f) knowledge reuse and reapplication.

KM contribution to enterprise performance resulting from: a) compressed time lost and work delays; c) increased experts' 'span of influence' and c) creative abrasion and creative conflict.

KM contribution to strategic performance accomplished by the speedy delivery of products and services; automating decision-processes of humans; quicker and more reliable responses to what is considered 'New'; and K-Value-Chains to K-Value-Networks.

More business performance statistics resulting from KM use as reported in a survey contacted by KPMG (2000) and cited by (Malhotra, 2002) show that 71% of businesses achieved better decision making, 68% achieved faster response to key issues and 64% delivered better customer service.

Yet, more KM potential benefits are identified in the literature, some tangible and some intangible. These include: improving the response time to customer requests and providing an overall improved customer service; improving the response to key business issues; improving decision making as old practices and lessons learned are usually useful for future decision making; increasing revenues by delivering products and services to the market faster; encouraging and enhancing innovation by promoting the free flow of ideas; enhancing employee retention rates by recognizing the value of employees' knowledge and rewarding them for it; streamlining operations by restructuring and eliminating redundant processes; employee development, and more.

Albeit, a successful KM implementation may result in improved efficiency, higher productivity and increased revenues in practically any business function, many senior executives may want a clear understanding of the benefits of KM before they proceed with the investment. This is understandable as any KM initiative, being an infrastructure project, may be budgeted for a specific amount, whereas, the benefits from its implementation may not be as tangible. Skyrme (David Skyrme Associates, 2014) suggest the presentation of KM benefits in the form of a tree, an example of which is shown in Figure 8.

[4] Info –glut is a technical term for information overload at a rate that exceeds our power to organize or comprehend that information.

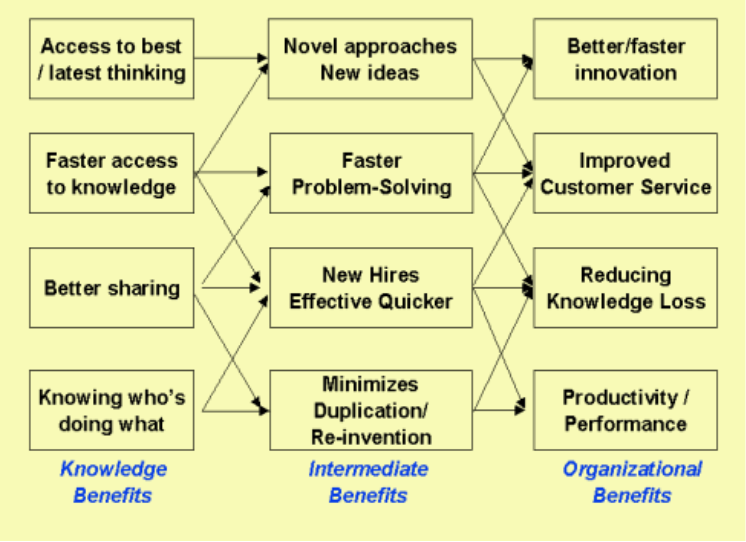


Figure 8. An Example of a Benefits Tree; Source: (David Skyrme Associates, 2014)

2.3.3. The KM Process and KM Frameworks

A KM development cycle should include phases for:

1. Collecting/Capturing existing knowledge
2. Organizing and storing knowledge (possibly by the use of a taxonomy)
3. Creating new knowledge based on existing knowledge
4. Refining new knowledge in order that it is placed in context and it becomes actionable
5. Managing knowledge to maintain currency, accuracy and relevance
6. Disseminating/Sharing knowledge between those who need it, when and where they need it.

A map outlining the main phases and stages of a corporate KM initiative is depicted by Figure 9 below (David Skyrme Associates, 2014). Phases can be executed sequentially or in parallel, and processes can be worked on iteratively.

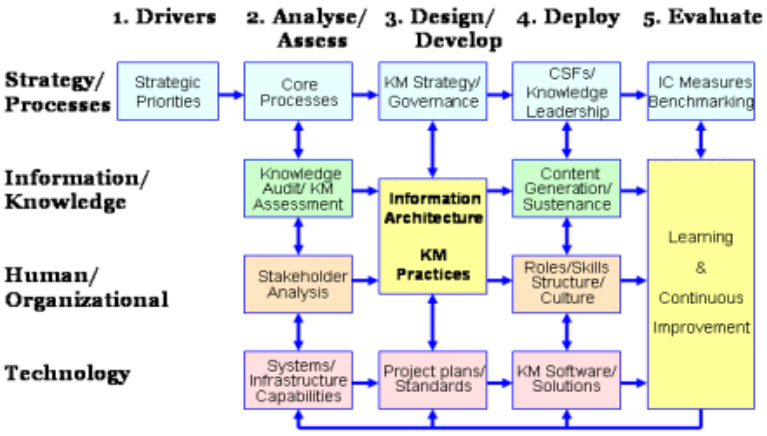


Figure 9. KM Phases and Stages; Source: (David Skyrme Associates, 2014)

Any successful implementation must consider taking a holistic approach. Such an approach must examine the business, human factors, technology, and knowledge dimensions.

The five processes illustrated in Figure 9; KM Phases and Stages, involve the following tasks (David Skyrme Associates, 2014):

Drivers: An examination of business strategies, priorities and issues relating to KM is performed.

Analyze/Assess: Run an information/knowledge audit and analyze the business processes, and stakeholders' needs. Match these requirements with KM capabilities and outline an ICT (Information and Communication Technology) required infrastructure.

Design/Develop: Involves devising an overall KM strategy which will include the management of knowledge, the principles and standards, an information architecture and KM practices, and appropriate ICT project plans and standards.

Deploy: The implementation phase which creates and manages the content, puts in place the appropriate structure, culture, people, and skills and following development, testing, and training, it delivers the ICT solution.

Evaluate: The measurement of the benefits and the value of KM as an ongoing process leads to continuous improvement.

Malhotra gives, to those interested to attempt a KM implementation, the following 10 advices which result from his long experience in the field (Malhotra, 2002):

- Identify knowledge critical to your business
- Align business strategy and knowledge management
- Analyze existing knowledge in your company
- Build on, not discard existing IT investments
- Focus on process and tacit, not just explicit, knowledge
- Design a future-proof, adaptable KM platform
- Build and deploy a results-driven KM system
- Implement leadership and reward structures needed to make KM work
- Evaluate initiatives using real options
- Learn from war stories.

It must be said that there exist a plethora of KM models or frameworks, suggested by various scholars. To mention a few more:

Wiig proposes a framework which includes: technical approaches, which mostly focus on technology enablers for knowledge; intellectual capital: involves the management of structural and human capital within organizations; and knowledge-related practices (Wiig, 2004). Wiig in his definition for KM emphasizes action, meaning the involvement of knowledge in decision-making and this is reflected in his framework for the implementation of KM.

In Girand's article one may observe a different model which includes as key enablers of KM the following five elements: In the foundation structure are Technology, Leadership, and Culture, then the Process structure includes the identification of tacit and explicit knowledge using socialization, externalization, combination and internalization (described by (Nonaka, 1998); (Nonaka & Takeuchi, 1995) in the SECI model) and the final element is Measurement which must follow any implementation (Girard, 2005).

In O'Dell and Grayson a model depicted by Figure 10 below describes the road towards best practice transfer (O'Dell & Grayson, 2004). The four enablers mentioned in this model being, Infrastructure, Culture, Technology, and Measurement, are incorporated in the process of KM implementation which involves phases for planning, designing, implementing, and scale-up.

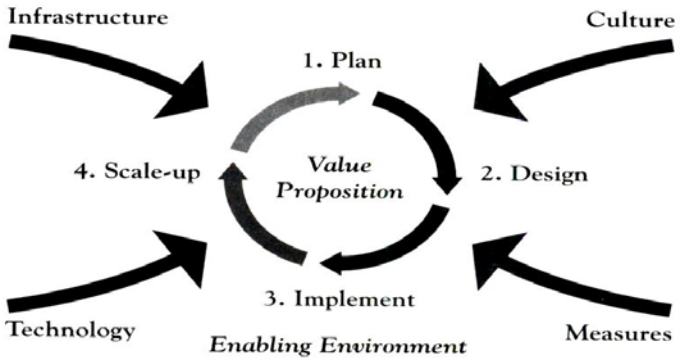


Figure 10. Best Practice Transfer; Source: (O'Dell & Grayson, 2004)

A different model was created by McElroy (McElroy, 2003) called the Knowledge Life Cycle (KLC) (Figure 11), which includes three processes being knowledge production, knowledge validation and knowledge integration which work on creating organizational knowledge which McElroy classifies as declarative (know-what) and procedural (know-how).

Huang suggested a framework in which he emphasized the need for the creation of a culture of knowledge sharing and collaboration. In his framework he included four processes: making knowledge visible; increasing knowledge intensity; building knowledge infrastructure; and developing a knowledge culture (Huang, 1998).

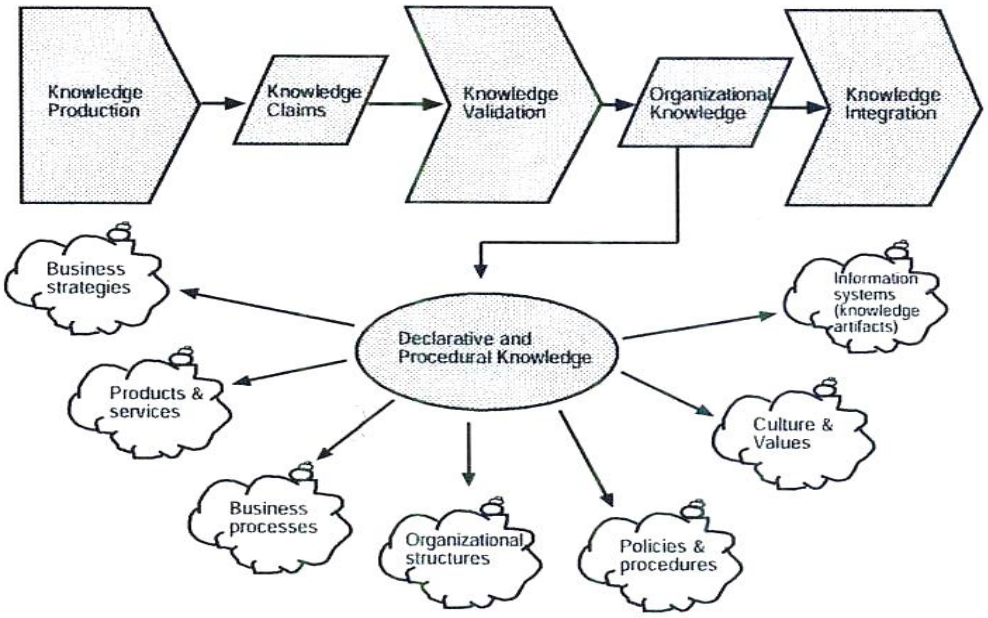


Figure 11. Knowledge Life Cycle; Source: (McElroy, 2003)

The American Productivity & Quality Center, APQC (American Productivity and Quality Center, 2014), a member-based nonprofit organization and one of the world's leading proponents of business benchmarking, best practices, and knowledge management research, is proposing an interactive KM framework (Figure 12) in which it outlines the stages of a KM strategy implementation along with the actions necessary at each stage.

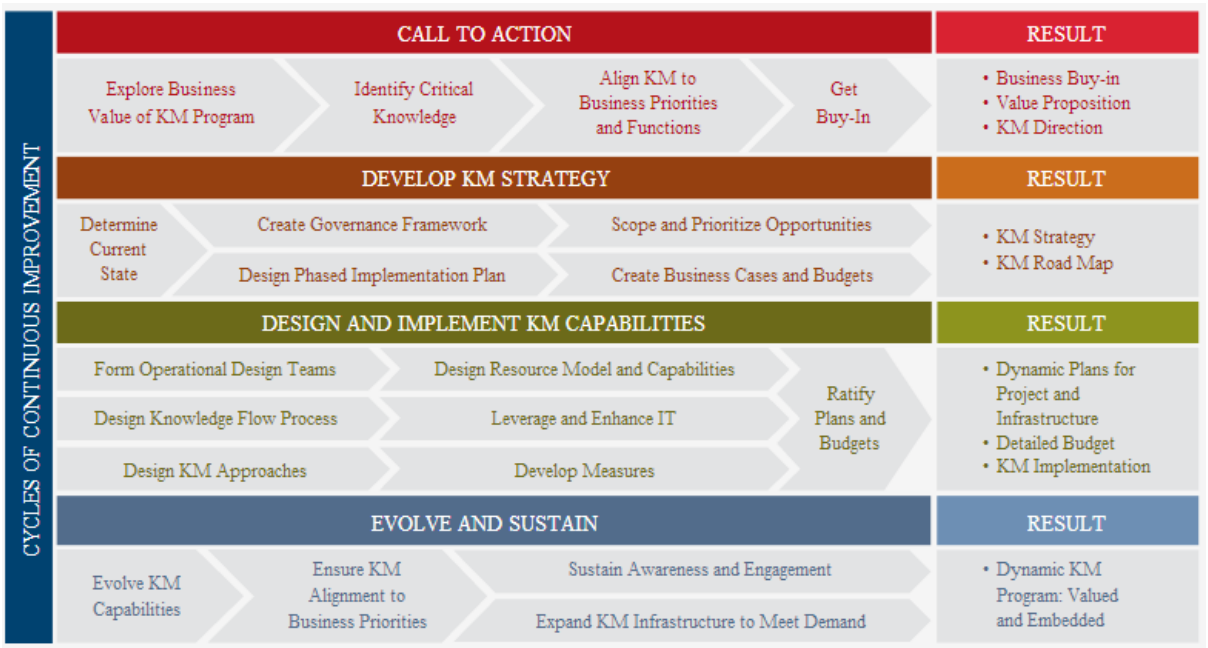


Figure 12. An Interactive KM Framework; Source: (American Productivity and Quality Center, 2014)

Another integrated model of KM was presented by Oliver and his co-researchers (Oliver, et al., 2003) as an adaptation from Handzic's work (Handzic, 2001) (Figure 13). This model addresses the contribution of the organizational environment shaped by the leadership style and culture; the technological infrastructure comprised of information and communication technologies which may act either as an enabler or an obstacle on knowledge processes which are in turn put in place

to create, transfer, and utilize organizational knowledge. The need for continuous knowledge measurement which may call for adjustment of strategies over time is included in the form of feedback.

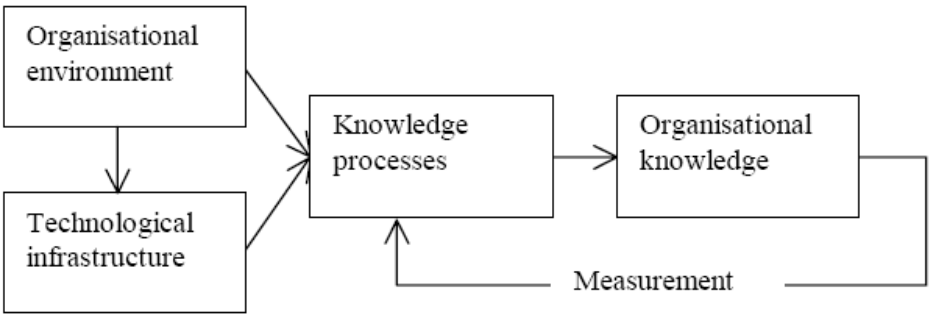


Figure 13. An Integrated KM Framework; Source: (Oliver, et al., 2003)

Finally, the most studied and referenced KM system which builds on the three pillars of Wiig (Wiig, 2004) is the one suggested by Stankosky and involves four pillars, each being a principle area containing many elements (Figure 14) (Stankosky, 2005). Statistical evidence for these four pillars is offered by the study of Calabrese (Calabrese, 2005). Thus, the four pillars supported by Stankosky are:

Leadership/management: Deals with the environmental, strategic, and enterprise-level decision-making processes involving the values, objectives, knowledge requirements, knowledge sources, prioritization, and resource allocation of the organization's knowledge assets. It stresses the need for integrative management principles and techniques, primarily based on systems' thinking and approaches.

Organization: Deals with the operational aspects of knowledge assets, including functions, processes, formal and informal organizational structures, control measures and metrics, process improvement, and business process reengineering.

Learning: Deals with organizational behavioural aspects and social engineering. This focuses on the principles and practices to ensure that individuals collaborate and share knowledge to the maximum. Emphasis is given to identifying and applying the attributes necessary for a "learning organization."

Technology: Deals with the various information technologies necessary for supporting and/or enabling KM strategies and operations.

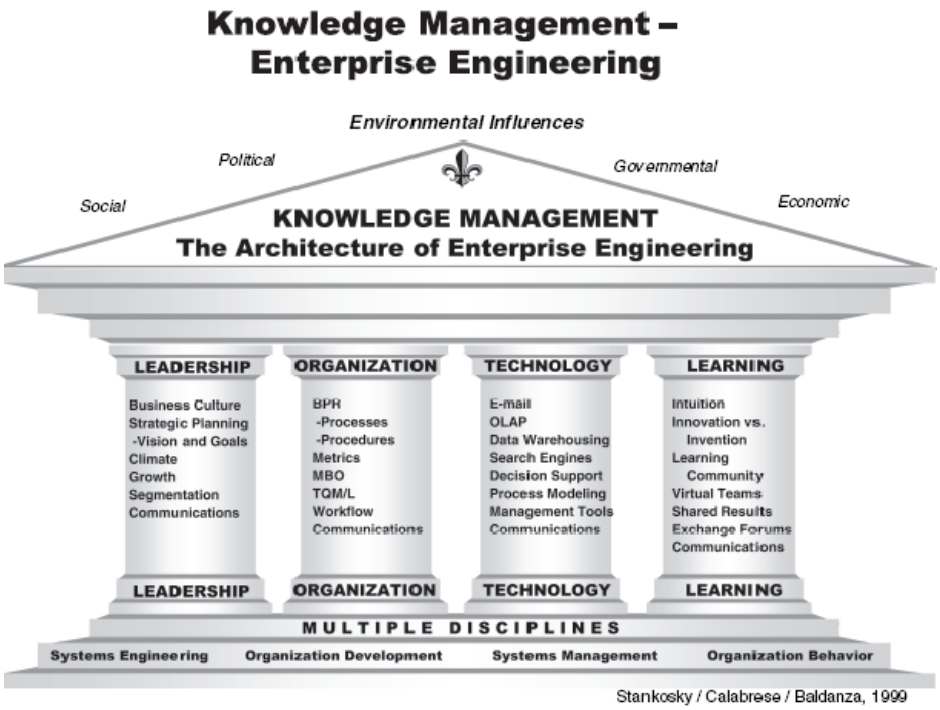


Figure 14. The Four Pillars of KM; Source: (Stankosky, 2005)

Lytras and Pouloudi have developed the representation which follows in Figure 15 to summarize their findings from an overview of different approaches concerning parameters of knowledge management (Lytras & Pouloudi, 2003).

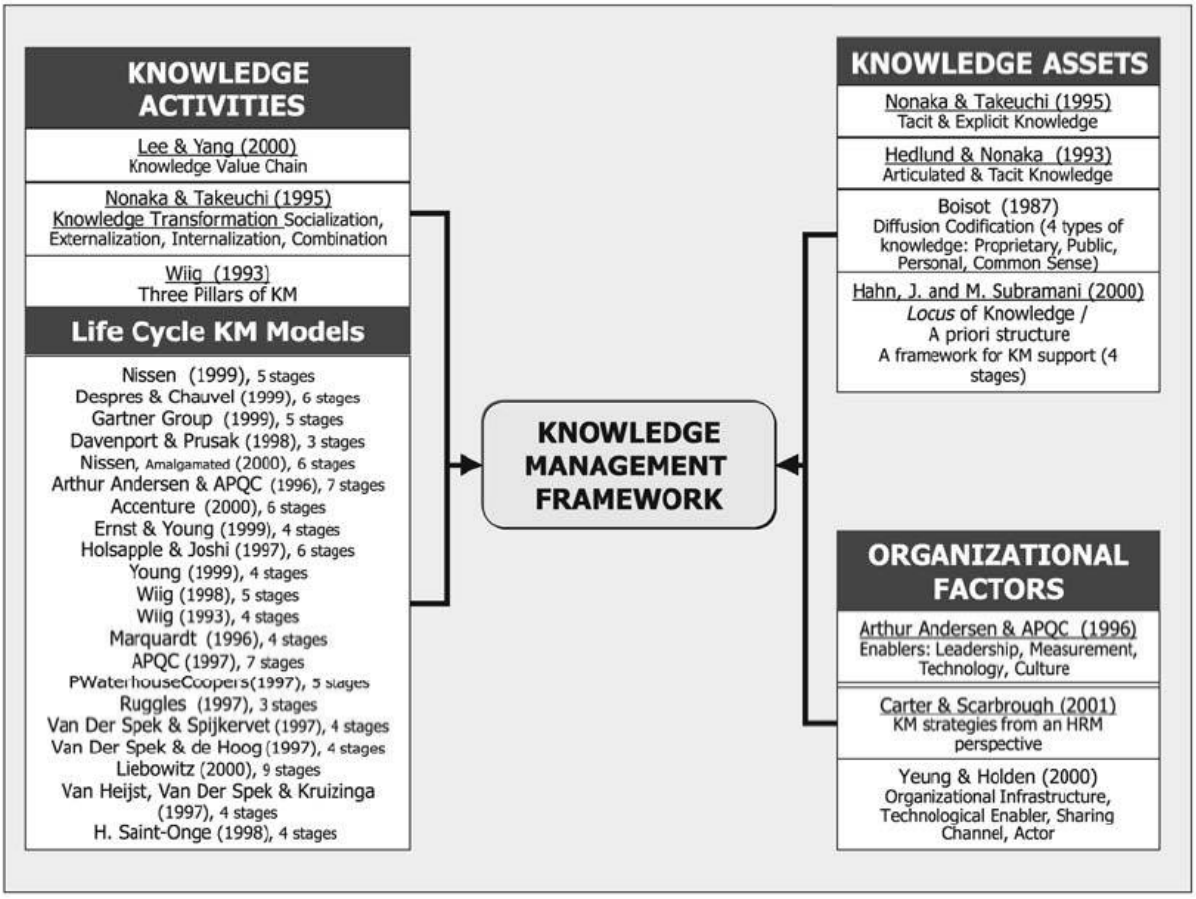


Figure 15. KM parameters - A literature mapping; Source: (Lytras & Pouloudi, 2003)

2.3.4. KM Enablers

Established within the KM frameworks of implementation are a number of areas which require direct attention and are considered as critical for the success of the KM effort. These may be referred to as critical success factors, KM enablers, or KM ingredients. Being critical to the success of the KM initiative if not addressed properly and adequately these same enablers may become barriers in enjoying the benefits of KM. If the organization's structure, systems, technology, and skill are in alignment with goals and direction, then it is very likely that KM success will follow.

Key success factors for a knowledge management implementation have been discussed in literature by several researchers. For example, (Chong & Choi, 2005) list as such factors employee training; employee involvement in KM activities; teamwork; employee empowerment (skills development); top management leadership and commitment in knowledge management; effective use of information and communication technologies; performance measurement; a knowledge-friendly culture; benchmarking; knowledge structure (such as communities of practice); and the resolution of organizational constraints.

Stankosky, summarizes 11 research studies addressing various aspects of KM and extracts the theoretical constructs, which he considers as most important for the successful KM implementation. Some of the conclusions reached from these studies (Stankosky, 2005) are:

- KM requires the integration and balancing of leadership, organization, learning and technology in an enterprise-wide setting.
- KM must not only recognize requirements and conditions for success, but also support the desired benefits and expectations of the enterprise.
- Streamlined organizational structures, with strong cultures, have a higher chance of KM success.
- An atmosphere/culture of trust is necessary for sharing knowledge.
- National culture affects the values and practices of every organization attempting a Knowledge Management implementation, especially at the lower levels.
- KM technologies contribute to organizational growth only if the flow and context of knowledge are supported.
- KM technologies are useful in managing and leveraging intellectual capital, but the size of the organization is a major variant.
- Successful KM technology implementation requires an organizational culture that promotes a blend of product and people orientation.
- KM success factors are dominated by management ones, such as culture, process, and organization, with technology as the least important.
- KM criteria for success should include both soft and hard measures if top leadership is to support KM initiatives.

In its implementation, KM finds numerous obstacles to its success. Ernst & Young carried out an international survey in 1996 on the barriers to KM success and reported the top five with percentages above 50% to be: Organizational culture, 80%; Lack of ownership, 64%; Information and Communication Technology insufficiencies, 55%; Non-standardized processes, 53%; and Organizational structure, 54%. (Ernst & Young KM International Survey, 1996).

Bennet and Bennet added to the above the lack of infrastructure support, and the inability to change culture (Bennet & Bennet, 2003). Brown reminded us about the resistance from cultural inertia and the difficulty that this causes in transferring the knowledge to effectively implement better business practices (Brown, 1999).

As for the insufficiencies of the information technology mentioned in the Ernst & Young Survey (1996) in relation to the expected benefits, these should mostly be attributed to the fact that the relationship between information technology and culture has not been observed as closely as needed.

In a "KM in Education" Summit held in 2002 in San Francisco, California, Petrides and Nodine identified the following common barriers to effective information use: Lack of staff; data collection not uniform; lack of leadership; lack of integration of technology; unclear priorities; distrust of data use (Petrides & Nodine, 2003). Other cultural barriers may include: lack of rewards/recognition for knowledge sharing; organizational inefficiencies (wrong person at wrong position); knowledge sharing not a part of daily work; privileged positions used for own personal benefit; lack of participation; lack of trust; lack of training; unwillingness to share knowledge. Other possible problems coming in the way of a successful KM implementation may include: lack of identifying the proper IT tool; lack of cooperation due to insufficient communication; the system is seen as too complicated; unsuccessful due to technical problems and/or technological limitations; lack of understanding of KM benefits; unsuccessful effort to pursue people to knowledge sharing.

It is understandable to feel insecure in sharing knowledge at the work place as knowledge is regarded to be a valuable resource. There is therefore a natural tendency in every individual to protect knowledge and not share unless s/he is convinced, rewarded or recognized properly (Chua, 2003). Motivating employees towards knowledge sharing and learning is not uncommon. For example Ernst and Young (Ernst & Young, 2013) and Price Waterhouse (O'Dell & Grayson, 1998) devised reward mechanisms for knowledge sharing activities whereby such activities are tied to the employee's performance evaluation.

All of these and possibly other obstacles must be removed to become the knowledge organization of the modern and the future reality. In this knowledge-based organization of the future shared knowledge becomes power and the organization behaves as an intelligent, self-selecting, self-

adapting system continually integrating and processing incoming data and information to determine its actions (Bennet & Bennet, 2003).

A list of KM enablers has been compiled below with the areas considered by most KM researchers as most critical to consider in KM implementations:

Organizational structure

An organization's structure is composed of its business strategy, people, processes and structure (Sanchez, 2004). People perform within the organizational structure which is expected to support organizational processes to accomplish the overall business strategy. The organizational structure which may best serve the transfer of knowledge requires a shift from the traditional hierarchical management structure since this allows for vertical (top-down) but inhibits the horizontal (between functional units) knowledge transfer. A more appropriate structure may be exploiting the role of knowledge workers from cross-functional areas of the organization thereby providing knowledge sharing between knowledge teams which expand to cover all functional areas of the organization. The suggestion of this knowledge team-based organizational structure is expanded by Walczak (Walczak, 2005). Overall, KM researchers talk about an organizational structure which will be promoting knowledge sharing. Some more specific suggestions call for a bottom-up, instead of a top-down, design of knowledge processes which will allow the individual knowledge workers to act spontaneously without much top-down intervention.

Strategy and leadership

On the practice of leadership, Hubbard and his co-researchers (Hubbard, et al., 2002) claim that effective organizations should rely on leadership rather than leaders. By this they suggest that knowledge leadership should be evident throughout the organization with knowledge leaders providing strategic visions, motivating, effectively communicating, acting as change agents, coaching others, modeling good practices and doing all that makes knowledge transfer effective (Debowski, 2006). The enthusiasm and energy which knowledge leaders demonstrate may have a strong positive effect on the organization's climate and may play a major role in building commitment from coworkers. Contributing more on leadership styles, Singh, found that the best form of leadership (at least in relation to the researched culture) which enables the transfer of knowledge is the delegating style wherein employees are given adequate power, authority, and responsibility to think and act, to experiment and innovate using knowledge and while working on any tasks (Singh, 2008).

It should also be stressed that a clearly defined knowledge management strategy with management support must be present. Alternatively strategies to improve communication, collaboration, training, etc., which will facilitate the knowledge transfer, may serve the same

purpose even though the main purpose of knowledge management may, in this second case, not be stated explicitly. Of course, strategies on one hand can facilitate knowledge transfer, and knowledge management on the other hand has the greatest chance of succeeding when it is applied to a specific strategic business goal.

A knowledge strategy should be collaborative and not competitive and employees should not compete for information but should rather coexist in relationships characterized by sharing and commonly offering to the growing of the existing knowledge. Part of the strategy should be the creation of strategic knowledge networks which will enable the free flow of knowledge assets among all stakeholders.

Technological Infrastructure

Technology is an enabler than needs to be carefully planned and implemented so as people can see it as a natural part of the way they perform a certain task. Effective knowledge management technology anticipates natural human behaviour, which is biased toward minimizing added work (Lotus, 1998). For example, even though employees possibly create a number of documents daily, they do not necessarily share them. But if the system asked them at the time of saving to provide some simple key words, categories, etc. they would not probably mind and the system would then be able to catalogue their file, delete old/obsolete material, publish it where necessary and inform interested people about its existence.

To fully exploit the opportunities offered by KM a variety of technological ICT solutions must be implemented in a hybrid environment in which humans and machines will complement one another.

A knowledge management platform which will deliver features and functions, and provide services which will help the organization to materialize knowledge management by even creating customized knowledge management applications may not be the simplest technological infrastructure to develop. More on knowledge management systems, KM technological approaches, areas and tools is discussed later on in following sections of this chapter.

The impact of KM on ICT investment is the composite of the expenses that each KM initiative will have in terms of required services and technology tools.

Culture

The human component made up of the organization's employees is the core of knowledge management. No KM strategy can be successful unless the organization has developed a trusting knowledge culture that emphasizes the role and value of knowledge in day-to-day business

decisions and enterprises. Such KM-friendly culture must be directed towards rewarding innovation, learning, experimentation, scrutiny and reflection (Allee, 1997) .

A study by Balthazard and Cooke investigated constructive and defensive cultures in relation to individual and organizational outcomes that promote KM success. The two researchers support that within an organization there may be a variety of cultures which may in fact explain why some organizational units exhibit behaviours that are counter to the organization's expressed values or mission. Via the culture people create expectations of behaviours, some of which can result in non-constructive interactions that hinder knowledge exchange. Balthazard and Cooke's findings show that constructive norms are positively associated with both individual outcomes (such as role clarity, communication quality, organizational fit, creativity, and job satisfaction) and organizational outcomes (such as quality of products and services, quality of customer service, organizational adaptability, limited turnover, and quality of the workplace) that promote KM success. On the other hand, defensive cultures (both passive and aggressive) are negatively related with the above individual and organizational outcomes that may cause KM success (Balthazard & Cooke, 2004).

Other researchers have also arrived to the conclusion that a competitive culture leads to individuals keeping their knowledge for themselves whereas a supportive culture may demote their self-interest and make them feel even morally obligated to share (Kulkarni, et al., 2006) (van Alstyne, 2005) (Voelpel, et al., 2005) (Wasko & Faraj, 2000) cited in (Loebbecke & Crowston, 2012).

Managers and leaders should actively encourage the knowledge creation and use. Additionally, management should promote the organization's workforce to build a positive orientation to knowledge which suggests that they become intellectually curious, they are willing and feel free to explore and they are willing to share without feeling that sharing knowledge will result in them losing power or will cost them their jobs.

A value system which is characterized by non-linear, dynamic and interdependent relationships needs to be adopted for the knowledge infrastructure to be effective.

Users are also sometimes motivated by benefits derived by other users; the "I am glad to help others" spirit. As observed in many settings, for example Wikipedia, people may share knowledge for altruistic pro-social reasons (Wasko & Faraj, 2000).

Organizational Processes

Knowledge intensive processes must be enabled in the KM environment with appropriate technologies. Table 1 below parallels some of the common components of a KM framework with the organizational processes supported.

Table 1. KM Technologies and Organizational Processes

COMPONENTS OF KM FRAMEWORK	ORGANIZATIONAL PROCESS SUPPORTED
Document management tools	Publishing, distribution
Workflow tools	Organizational procedures and routines
Conferencing tools	Communication, dialogue
Decision support systems	Problem solving, decision support
Shared workspaces	Brainstorming, tacit knowledge capture
Databases, Data warehouses	Operational data, data mining, knowledge discovery
Groupware, extranets	Collaboration, coordination
Intranets	Distribution, connectivity, publishing

Measurement

In an organization in which the management is committed to implementing KM and has adequate performance measurements, the value contribution of KM can be made more transparent so as to encourage continuous usage. Determining the presence and impact of KM in the organization is analogous to measuring the contribution of employee development or any other management or organizational competency.

De Brun supports that measurement is the least developed aspect of KM (De Brun, 2005). Nevertheless, for any business investment senior executives may rightfully want a clear understanding of the benefits before they proceed with the investment. Once clear objectives are set at the initiation of the KM implementation it will be easier to later on measure the resulting performance against these preset objectives. Without measurable success, enthusiasm and support for KM is unlikely to continue and without knowing what works and what does not, how can you decide what to continue doing and what to adjust?

It makes sense to measure KM effectiveness as part of the organization's overall performance measurement systems since KM practices should be made an integral part of work processes. However, if this approach is followed one may not be sure of the relative contribution of the KM practices to the overall success of a project or process. Alternatively, measurement could separately be done for both outcomes and activities. In terms of measuring outcomes the focus is on the extent to which a process, which includes KM efforts, achieves its stated objectives. In terms of measuring activities the focus is on the specific KM practices that were used in the process or project.

Any KM initiative includes organizational instruments, such as incentive systems for cultural change, reward tenure, or process reengineering, as well as the information technology foundation for knowledge sharing and transfer. Performance indicators must be selected to relate to the business objectives especially the KM goals of the organization. As a KM initiative may span over a period of some years to produce real business value (Davenport & Prusak, 2005) different performance indicators may be necessary at different stages of the project. A KM measurement framework should also be interoperable with other business measurement

instruments and some of the popular instruments have in fact incorporated measures specific to KM practices.

North and co-researchers (North & Kumta, 2014) cited in Resatsch and Faisst (Resatsch & Faisst, 2004) group metrics' indicators in classes as shown in Table 2 below.

Table 2. North's Classes of Indicators; Source: (Resatsch & Faisst, 2004)

Class of Indicators	Definition of Item
Class I: Knowledge base indicators	Constituents of the organizational knowledge base in qualitative and quantitative terms
Class II: Cost indicators	Cost of processes and inputs for changes in the organizational knowledge base
Class III: Intermediation and transfer indicators	Measure direct usage of the knowledge base and the results of knowledge transfer resulting in intermediate effects on the organization.
Class IV: Effect indicators on business results	Evaluation of the effects on business results

Some popular measuring instruments which may also be used for KM performance measurement are:

The Balanced Scorecard (BSC) (Kaplan & Norton, 1996): Has evolved from a performance measurement framework to a full strategic planning and management system which besides offering performance measurements, it enables executives to execute their strategies. Kaplan and Norton suggest using BSC measures for assessing future investments. They claim that executives can best see the relationship between investment and strategic plans by establishing measurable metrics in relation to long-term objectives. The scorecard considers four business perspectives, being: the Learning & Growth perspective; the Business Process perspective; the Customer perspective; and the Financial perspective. The perspective which is related more closely to KM is the Learning & Growth perspective which is of course a vital component in any learning organization. Though Kaplan and Norton (Kaplan & Norton, 1996) suggest a top-down implementation of a BSC in the case of intellectual capital and knowledge management a bottom-up approach may be needed (Wegmann, 2008).

Return on Investment (ROI): Calculating and comparing costs and benefits of knowledge management are not necessarily easy except from costs which relate directly to purchases of information technology. Other costs which relate to process improvement, culture-related measures, etc. as well as the measurement of benefits such as enhanced knowledge sharing, faster learning, etc. cannot be quantified easily.

Measuring KM Maturity: APQC, (APQC, 2013) the American Productivity and Quality Center, amongst others has developed a framework they call the "Road Map to Knowledge Management" which involves a map guiding businesses through the stages of KM implementation.

Employee Surveys: To assess aspects of organizational culture, and capture changes in employees' behaviour, opinions, attitudes, etc. surveys may be used as an additional form of measurement of KM success.

Measures of the value of knowledge assets: There exist a number of key models for measuring the value of intellectual capital. These include: the Skandia Navigator and its associated Value Creation Model; the Sveiby's Intangible Assets Monitor; the Intellectual Capital Services' IC-Index; and Philip M'Pherson's Inclusive Value Methodology (IVM).

2.3.5. Benchmarking KM

Benchmarking helps in understanding where the organization is in comparison with other organizations in the industry with respect to knowledge, competency and capability which helps in the growth of the organization.

ISO Standards

ISO (the International Organization for Standardization) is a worldwide federation of national standards' bodies (ISO member bodies). ISO standards are used worldwide for benchmarking purposes in relation to a number of practices. There is no dedicated standard to knowledge management. KM is partially covered in the standard which regulates electronic records and content management; this is the ISO 16171 (ISO, 2010) on Principles and functional requirements for records in digital office environments (Cyprus Organization for Standardization, 2014). ISO 16171 sets the requirements and offers guidelines to businesses interested in the creation and management of digital records. The ISO 16171 standard could also be used to revise the organization's strategy to incorporate content management practices.

Knowledge management is of course also included in other standards, guidelines, laws and regulations such as the US Code 1103 (U.S. Government, 2014) which outlines the powers and duties of the USA Chief Human Capital Officers and addresses KM in one of its sections.

Business Quality Models

KM is also addressed in different business quality models which incorporate KM practices in their directives. The business model may be articulating KM issues using business terms and mapping the KM issues to the model. When the model is adopted by a business, KM is not viewed as something external and additional which needs to be given separate attention to but instead it is already practiced, it supports and enhances the way the business operates. One such business quality model is available by the European Foundation for Quality Management (EFQM). A second business model is available in the framework of "Investors in People". Other such models are also available.

The European Foundation for Quality Management (EFQM) Framework for KM

In a booklet published by EFQM to address KM (EFQM & CIBIT Consultants, 2005) EFQM describes the joint efforts taken initially in 1997 and 2001 with CIBIT and the American Productivity & Quality Center (APQC) to benchmark good practices in the area of knowledge management. More recently, 2005, the EFQM Framework for Knowledge Management was announced. The framework is based on the principles that: a) The new framework is aligned with the EFQM Excellence Model in order that businesses already using the Excellence model will find it easy to adopt the KM model as well as to assess their KM practices; b) KM professionals may benefit following an approach which will allow them to align their activities to the continuous improvement of the business; c) Organizations can assess their current priorities and target their KM practices; d) A clear focus of the framework is towards the enablers' criteria. Organizations are urged to consider specific desirable results / benefits and target their KM efforts in the right direction (Figure 16); and e) KM is most effective when it is approached holistically through integrated initiatives which will be aligning human resource issues, ICT infrastructures and informal learning practices so as to enable the organization to improve the quality of the knowledge it holds, while at the same time enhance access to and retrieval of the knowledge.

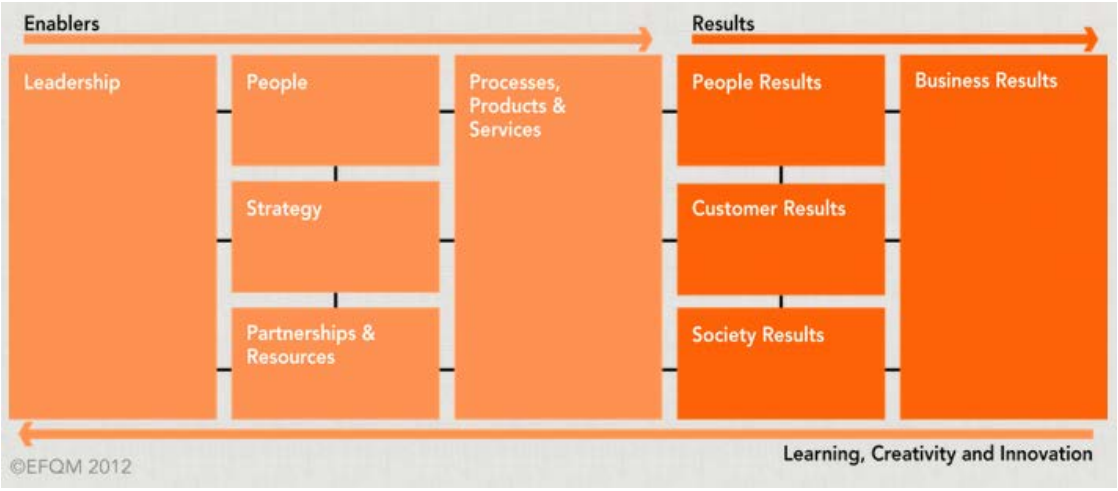


Figure 16. The EFQM Excellence Model; Source: (EFQM, 2014)

The Investors in People Framework

The Investors in People framework (shown in Figure 17) was designed by businesses, for businesses and was written in consultation with customers, employees, and people management specialists to meet the needs and challenges of today's businesses. It can be used to benchmark for a well-run organization committed to good business and people management excellence (Investors in People, 2014).

As one would expect, the model addresses knowledge and knowledge sharing. The areas which are most related to KM are located under: a) Management Effectiveness -- the examination of managers as role models of leadership, teamwork and knowledge sharing; and b) Involvement

and Empowerment -- the extent to which knowledge and information are shared (Investors in People, 2014).

Figure 17. The Investors in People Framework; Source: (Investors in People, 2014)

2.3.6. KM Practices and Lessons Learned

As organizations become more knowledge-based, their success will increasingly depend on knowledge workers becoming successful at contributing to effective decision making and creating innovation.

Nonetheless, not everyone is equally successful in their efforts to adopt KM. While many organizations such as McKinsey and Co, Ernst & Young, Coopers & Lybrand, KPMG, BP/Amoco, Ford, Xerox, Siemens, Cisco and others have successfully embedded KM in their practices (Rowley, 2000) (Stankosky, 2005) many others have abandoned it, because it did not deliver on the promises, or they simply did not consider it relevant to their operations. Such organizations might have tried using KM tools without fully understanding the difficulties in their implementation, thus, they frequently achieved less than anticipated results. A third group includes those who were not convinced about the need and the benefits of KM and viewed it as a fad, so they just ignored it.

Some Knowledge intensive organizations can be considered leaders in their KM practices, as is for example Ernst and Young (EY) a long time top player in the area of knowledge management and organizational learning who have released several publications on knowledge management. One of their recent awards is their recognition in 2013, for the 15th time, as the Most Admired

Knowledge Enterprise worldwide –MAKE (Ernst & Young, 2013). In one of their latest publications (Ernst & Young, 2014) in which they publish the results of a study, they report an average of 81% of survey respondents identifying knowledge as the most critical factor for business success, followed by 78% voting for products, and 73% going for financials as other business success factors. Knowledge related activities involved the capturing and sharing of the insights contained in the organization's own people and practices as well as collecting knowledge available in the external environment. Two of the top three strongest opportunities for success which survey participants identified were related to knowledge. Additionally, knowledge in all its forms – expertise, experience and learning - was viewed by business leaders as critical across a range of sectors. EY employees' practiced successfully a centrally managed knowledge organization, referred to as the CBK – Centre for Business Knowledge, and had universal access to its knowledge-powered intranet (Ernst & Young, 2014).

Companies with a focus on KM pay close attention to issues of collaboration, organizational learning, best practices, workflow, intellectual property management, document management, customer-centric focus, and using data effectively. KM initiatives include portals that use the web to span communication across an entire enterprise and to promote business-to-business relationships (Roberts-Witt, 1999). The Internet is also used intensively for team collaboration and groupware: natural language queries of data; sharing information on best practices; and anytime/anywhere online learning (Delio, 2000) (Sherman, 2000).

Definitely it would be worth-while examining and learning from the successes of such companies as Ernst and Young or Hewlett-Packard, the number two computer company worldwide, who has also been recognized in the industry for excellence in KM; Hewlett-Packard Consulting has been recognized as a best practice KM company by APQC (American Productivity and Quality Center) and received the recognition of the Most Admired Knowledge Enterprise for the years 1998-2000.

Linkage Inc's Best Practices in KM & Organizational Learning (Harkins, et al., 2003) includes a case on Ernst and Young (EY) and another one on Hewlett-Packard (HP) (Harkins, et al., 2003). EY, on one hand, have implemented a number of successful Web-based navigation tools such as a Knowledge Catalogue, a Knowledge Search Engine, Community HomeSpaces, Service Delivery tools, and a completely configurable Personal Intranet Home Page. Their reported lessons learned involved the realization that Communities of Interest required help to organize their knowledge and knowledge-sharing abilities; and the realization that a variety of different KM programs were needed since different users have different behaviours. Additionally, they identified two more critical factors being that the change should be evolutionary, i.e., progressive, rather than revolutionary and there should be focus on deliverables so as to make the development identifiable, and KM tangible to users.

HP, on the other hand, sited amongst the lessons learned from the KM implementation that KM must enable the business strategy by focusing on the critical business knowledge and measuring progress as well as results; KM must be embedded into the business strategy and core work processes; desired behaviours must be continually modeled and rewarded by leadership; knowledge processes must be embedded into work processes; and employees must be given time for sharing, learning; and codifying; and technology should be treated as an enabler, not a driver.

2.4. The KM IT Infrastructure

Business tools were developed to help organizations create environments that make maximum use of employee knowledge and creativity. These include benchmarking, business process reengineering, lean production, value chain analysis, agility, integrated product teams, balanced score card, and more recently, knowledge management (Bennet & Bennet, 2003).

Several technologies could be put in place to develop a KM environment. These may include: intranets, extranets, project management, work flow management and electronic task management, collaboration tools, content and document management, groupware, data warehouse and data mining, decision support and group decision support systems, intelligent agents and web conferencing among others.

In very broad terms KM tools comprise information technology which enable the maintenance of and access to a repository of knowledge, the organizational structures, both formal and informal, which facilitate the interactions between people, and other specific knowledge tools which may include a centre of excellence required to employ experts whose knowledge could be valuable for the organization overall (Birkinshaw, 2001).

It is also possible to match specific KM objectives with the technology which may be used to enable them (Table 3).

Table 3. KM Objectives and Technology Enablers

KM OBJECTIVES	TECHNOLOGY ENABLERS
Find and collect knowledge	Knowledge bases, search-and-retrieval tools that scan both formal and informal sources of knowledge, employee skills' directories.
Create new knowledge	Collaboration support tools, groupware, rational databases, and decision repositories.
Package and assemble knowledge	Customized publishing tools, customized discussion groups.
Apply knowledge	Search, retrieval, and storage tools to help organize and classify both formal and informal knowledge.
Reuse and revalidate knowledge	Customer-support knowledge bases, services discussion databases, and project databases.

ICT tools used in KM may be grouped into capture tools (e.g. intelligence databases), communication tools (e.g. distributed networks, blogs), and collaboration tools (e.g. interactive web pages, wikis). It is also possible to connect ICT applications to the KM life cycle (Figure 18).

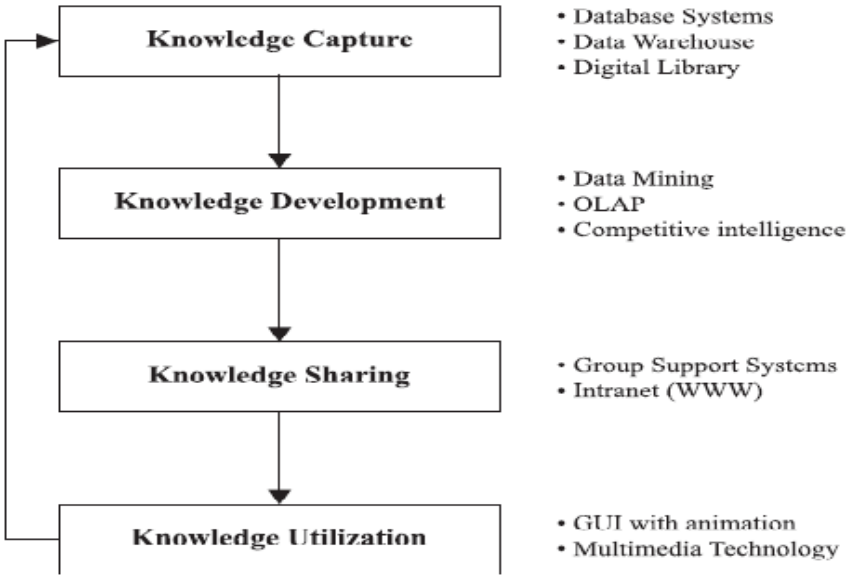


Figure 18. ICT Applications and KM Main Activities; Source: Lee and Hong, 2002 cited in (Lytras & Pouloudi, 2006)

Alternatively, KM tools may be categorized by considering their offered functionalities and techniques (Tsui, 2003) (Malafsky, 2003). Thus,

Search engines which provide for powerful searches and offer for keyword search, attribute-based input search, context- or user-sensitive search, and collaborative filtering techniques. The results of searching can be disseminated to a group of interested parties.

Meta/Web Crawlers are web-based tools which facilitate parallel searching on several sites with the use of metadata and indexing; the opportunity to combine and rank the results; and detection of changes in the content of sites which they follow.

Process Modeling and Mind Mapping tools though they are usually stand-alone products (sometimes offered as personal KM tools) not bundled into some complete KM system, are offering a visual aid for capturing procedural and declarative knowledge.

Case-Based Reasoning tools enable past cases to be reused in new situations by making the necessary modifications.

Data and Text Mining tools enable meaningful patterns and associations of data to be identified. These tools are usually part of a KM complete solution.

Taxonomy/Ontological tools collect related terms and define different types of relationships between them. For example medical ontologies representing injuries, body parts and clinical information.

Groupware tools with common features which include email communications, instant messaging, discussion areas, file areas or document repositories, information management tools, and search. These are usually made available through intranets, and other groupware platforms.

Measurement and Reporting tools focus on defining criteria to quantify the value of human capital, intellectual assets, and the Return-On-Investment for KM-related projects.

E-learning tools integrate learning and mentoring in the daily workspace (Tsui, 2003).

Collaboration tools are divided into synchronous and asynchronous. The former, offer for real-time collaboration as in meetings or in a classroom. Tools offered include real-time chat, instant messaging, whiteboards, audio/video and application sharing. The latter group of asynchronous collaboration tools provides a space for storing work such as a document library with the possibility of following a threaded discussion between users. The two categories may be merged.

Expertise Location tools can be filtered online directories of names and contact details or may include document and email analysis that automatically build the directories based on a user's query.

Visualization tools create visual categorizations of large volumes of information.

Agent Technology tools are used to monitor knowledge resources and alert the user when new information is added or information is changed (Abdullah, et al., 2005).

Figure 19 provides a summary of the KM components.

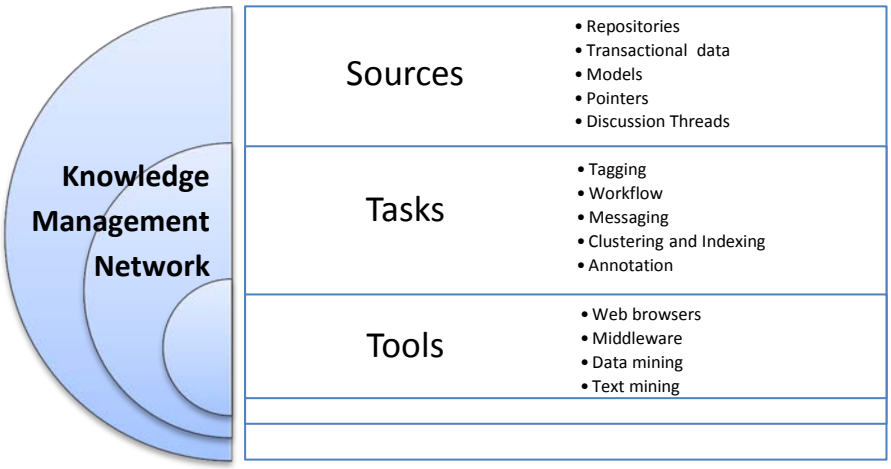


Figure 19. KM Network and Components

2.4.1. KM Approaches

Before initiating any KM implementation it is important to appreciate the need for a variety of approaches and tools to be used in order that the right kind of environment for a specific organization's people, structure, and unique culture is created. Such key approaches for knowledge management retention and transfer may include any of the tools, techniques, and functionalities mentioned above as well as other which are gaining ground and are often used by best-practice organizations. Amongst the most popular KM approaches are:

Communities of Practice (CoP) which are networks of people in a common (this characteristic is not a necessity) area of practice with the same professional interests (or just interests), who share

information and knowledge. In fact the inventor of the term “Communities of Practice” (Wenger-Trayner & Wenger-Trayner, 2014) first used it to denote a living curriculum; learning which is embedded and is part of practice in a community. CoP, which are also referred to as homogeneous communities (Fischer, 2001) are widely regarded as “the Killer KM application” (De Brun, 2005). Knowledge and documents may be classified for the use of the community into a taxonomy which will enable efficient retrieval.

Communities of Interest (CoI) referred to as heterogeneous communities (Fischer, 2001) are formed of people with a common interest but not necessarily the same expertise.

Lessons learned used as a knowledge sharing approach intends to collect employees’ experiences and proven practices which relate to a particular business process, project or event with the intention to reuse them to improve internal processes, reduce risks, minimize costs and improve the overall customer service. For example, NASA’s Lessons Learned Information System (LLIS) facilitates the integration of lessons learned into its policy, standards, procedures, and training (APQC, 2013). Another example is the tool used by the US army to capture lessons learned during and after an activity or project, called After Action Reviews (AARs) (De Brun, 2005).

Storytelling is also used to record employee experiences in a more informal way. Such stories are instrumental in raising awareness about knowledge sharing and collaboration. Storytelling can be a powerful tool for knowledge retention and transfer. Stories can supply context for organizational successes and lessons learned, and each story has the potential to personalize an issue by bringing it alive for listeners or readers. Stories are also an effective way to bridge generational gaps, communicate important information about an organization's culture, and help employees develop a sense of organizational identity. At Fluor Corporation (a best-practice organization), the storytelling process is tied to the organization’s global success story campaign which is part of the Knowvember campaign, an annual, month-long promotion to raise awareness of KM within the organization. (APQC, 2013)

Knowledge audits and structured interviews aim at identifying areas of knowledge and extracting critical knowledge from employees. Alternatively, a handoff document may be used to capture information about a person’s job especially before withdrawing from the particular position (APQC, 2013). Sometimes exit interviews may be used for the same purpose.

Mentoring and apprenticeship programs may be used for what their name suggests, i.e., mentoring and developing, but may also offer for transferring knowledge from the experienced employee, who is usually the one who conducts the program, to a more junior employee, the attendee. Such programs may be technologically enabled by the organization’s KM portal, offering for a discussion forum, the classification, searching and sharing of documents, etc. Knowledge centres may also be established to serve the same purpose.

In-house training is oftentimes facilitated by training groups, support desks, partner training organizations, etc., and may be enhanced via e-learning training. Training may be offered at recruitment, for promotion purposes, and throughout the employee's career as targeted training courses. Several best-practice organizations use their Subject Matter Experts (SMEs) in place of more traditional instructors to teach internal courses. Aerospace Corporation (another best-practice organization) has created courses such as the "Learning the Business of Aerospace" which is offered to new employees to inform them about the resources available to them to succeed in their jobs, and "Learning the Culture of Aerospace" which feeds employees into the values and behaviours that the organization expects from them, including knowledge sharing. (APQC, 2013)

Retiree programs are also used by some best-practice organizations to utilize retirees' experiences and needed skills in mentoring, story-telling, training and even fill-in needs of the organization. Examples of such programs are Michelin's "retiree employee" program, and Aerospace's "retiree casual" program (APQC, 2013).

Though **wikis** are not listed amongst the most popular KM tools some researchers (Bibikas, et al., 2014), (Grace, 2009) support their use as a simple tool for capturing knowledge, communication and collaboration.

2.4.2. Knowledge Management Systems (KMS)

A KMS takes the meaning of creating a uniform environment for users offering multiple KM tools as well as access to multiple data sources. Such an environment is found in KM or Knowledge portals (KP), which are Web-based centres, offering people important and relevant information and links to other sources of information from a single point of access (Malafsky, 2003). A portal can be seen as a system which is designed to provide secure, customizable, personalizable, and integrated access to dynamic information whenever it is needed by compiling it from a variety of sources (Deltor, 2004) (Smith, 2004). Portals may be broadly or narrowly focused. Examples of portals are Plumtree, K-station, SharePoint Portal Server, Hummingbird EIP, Portal-in-a-box, XPS Portal, Verity K2, and KnowledgeCenter. Some commercially available systems, some of which are classified as Enterprise Resource Planning (ERP) systems but also offer several KM functions, include the SAP NetWeaver platform, IBM Lotus Notes, SIEBEL Brightware eService applications, Confluence, Microsoft SharePoint Portal Server, etc. (for a listing of the features and a possible comparison between these systems refer to Appendix A).

The objectives of developing and deploying a KMS are according to Tsui (Tsui, 2003): a)Capture, create, and share knowledge assets; b) Locate relevant information knowledge; c) Provide an

environment for knowledge exchange; c) Connect people with relevant interest and/or skills; and e) Facilitate and/or support intelligent problem solving (e.g. decision making).

KMSs can be characterized by the approach they use in storing and retrieving the source data. Two are the most dominant approaches (Tsui, 2003) used are: the codification approach which collects all of the reusable assets and stores them into one or more repositories which are then accessed by powerful search engines using indices, keywords, and other ways (this approach focuses on explicit knowledge); and the personalization approach which focuses on the users which are grouped into virtual groups or knowledge communities based on their common needs and interests (this approach focuses mostly on tacit knowledge). The two approaches are complimentary and allow for knowledge reusability with minor or major adaptations to suit the current situation.

Another key characteristic of KMS is the currency of their offered content. To achieve this they make use of architectures based on dynamic real-time retrieval from databases using a modular structure to separate the data from the code for accessing and presenting it, so that only the information source itself must be updated.

One of the essential functionalities of a knowledge portal (KP) is of course the collection and organization of knowledge. This may be satisfied using a Content Management System (CMS), technology which allows an organization to collect and categorize all content, which mainly involves explicit knowledge, which has already been expressed in some written textual form. The remaining functionality must be added by the KMS. Many organizations are adopting Knowledge Portals or Enterprise Information Portals (EIP) to provide a single entrance into their data sources and applications. An enterprise information portal is not a single technology or application but rather a front end to all the knowledge management functionality within an organization.

A KM infrastructure consists of a KM Platform (hardware and system software) and a KM Solution which includes all the functionalities needed to help knowledge workers find, capture and utilize information as quickly as possible. In the case of a KMS, this should offer the following necessary KM functionality (Sun Microsystems, Inc., 2001):

Integration

A goal of knowledge management systems is to integrate the underlying data repositories of structured (e.g. enterprise applications, legacy systems, data warehouse, etc.) and unstructured (text documents, groupware applications, e-mail messages, web pages, etc.) information.

An open architecture enables enterprises to cost effectively and seamlessly integrate their diverse applications and repositories giving knowledge workers efficient access to the organization's knowledge capital.

Search

Search technologies enable users to find items even if names are misspelled and to find documents relevant to a query even when the query term does not appear in the document text (concept based queries). These search technologies include: a) Linguistic analysis: Treats text as a list of words or as more complex structure such as a semantic network; b) Statistical pattern recognition: Treats text as patterns analogous to images or audio signals; c) XML tags: Converts unstructured data into structured data and d) Pattern-based algorithms: Identifies data patterns based on identification of phrases, clustering by linkages between pages, and word usage patterns.

A high performance system ensures that search items are located quickly even when thousands of users are online concurrently.

Categorization

The essence of categorization is putting information into context. Categorization clusters information on a topic within the same category, thereby leading users to related information. The Yahoo taxonomy is an example of categorization.

A highly scalable system enables organizations to increase computer power to meet growing information needs.

Collaboration and Communication

Collaboration and communications solutions enable knowledge workers to interact amongst themselves or with customers, partners and other stakeholders. Collaboration solutions are especially useful in helping knowledge workers share tacit knowledge. The core functionalities of collaborative tools include shared workspaces for posting and exchanging files, tasks, and other project information; electronic messaging; e-mail; group calendaring and scheduling; shared folders and databases; shared document writing spaces; net meetings; video conferencing; threaded discussions; and real-time data conferencing.

Personalization and Profiling

Personalization solutions enable knowledge workers to tailor information feeds and information displays (customize) to suit their professional and personal needs. User and role management which recognizes and administrates users and access is required (Carlson, 2003) (Collins, 2003). Roles can be defined according to tasks and used to pre-determine knowledge feeds to each user group (Patnayakuni, et al., 2006).

Individual profiling is a component of a personalization solution. Based on profiles of user interests and job functions, personalization solutions scan the information environment for new

documents, news, and other information that may be relevant to the user. When items of interest are found, they are sent to the appropriate parties.

An open architecture platform allows enterprises to choose the personalization solution that best meets their needs and requirements as opposed to being constrained by factors such as system compatibility.

Workflow

Workflow management solutions enable knowledge workers to manage and track projects throughout a workgroup or across an enterprise. Workflow solutions should be designed to ease the creation, deployment, modification, and management of business processes. A high performance system ensures that all material is communicated to all relevant parties in minutes rather than days or weeks.

Decision Support

Decision support is another important component of a knowledge management strategy. Decision support has been associated with business intelligence. Traditional business intelligence tools were focused on structured data within databases and running SQL queries against these databases. Today, a number of new technologies centre on the analysis of unstructured data. Text mining is one of these technologies. Text mining is geared towards learning and discovering previously unknown information. A high performance system enables terabytes of data to be analyzed and understood quickly.

User Interface

A unified user interface is the window to all the functionalities and information repositories that knowledge workers need in order to improve productivity, increase customer satisfaction, reduce costs, and so on. To be effective, the interface of the knowledge portal must be characterized by visual integration. Additionally, it must be easy to use, provide a single point of access, and utilize space efficiently. Several factors underscore the importance of an effective user interface which should be characterized by a single point of access, effective space utilization, and ease of training and use. An open and extensible system platform enables enterprises to tailor the user interface to their needs.

Security and User Rights' Management

Given the various job levels and functionalities that exist within enterprises, organizations must be able to ensure that information is presented only to individuals who are authorized to see it.

Bibikas and his co-researchers (Bibikas, et al., 2014) claim that the majority of the available KM tools, techniques and methodologies have been developed for large firms and most of them are

expensive to purchase and require the commitment of significant resources for their implementation and maintenance. They therefore suggest that for the management of knowledge in small knowledge-intensive firms it would more appropriate to attempt to leverage the characteristics of enterprise social software such are wikis, blogs, social bookmarking, semantic search, etc.

2.5. KM-Related Areas and Terms

This section provides a brief description of certain areas which are closely related to KM.

2.5.1. A Learning Organization

Knowledge and learning have a synergetic relationship. Learning is the process of creating knowledge and knowledge guides the process of learning.

A learning organization is one that learns continuously and transforms itself. Learning is a continuous, strategically used process, integrated with and running in parallel to work (Watkins & Marsick, 1993).

A learning organization is expected to constantly improve its results based on increased performance made possible because of improved competencies. Before an organization becomes a knowledge organization it must first establish the necessary channels of learning and ensure the properties of a learning organization.

Learning is the desired outcome and is expected to influence performance and enable personal and organizational improvement. Training and education are necessary tools for learning but may not be enough unless they are paired with information flow and knowledge sharing; vision and strategy; individual and team development (empowerment); and rewards and recognition (Griego, et al., 2000). Thus, knowledge sharing is incorporated in learning and learning on the other hand must be facilitated for knowledge sharing to be meaningful.

Watkins and Marsick identified certain activities which characterize an organization that is becoming or is a learning organization (Watkins & Marsick, 1993). These activities emphasize the need for system-level, continuous learning which generates and manages knowledge outcomes leading to improvement in the organization's performance and value.

In a leadership and knowledge management system directive of the US government (U.S. Government, 2014), one of the five critical factors which are identified, concerns continuous learning via which leaders foster a learning culture amongst the employee force, and provide opportunities for continuous development as well as encouragement for participation. Leaders

invest in education, training, and other developmental opportunities to help the employees build mission-critical competencies.

Marquardt lists the following elements as necessary for a learning organization (Marquardt, 1996):

Collaboration: Using the social media, the internet, internal (intranet) and external (extranet) systems people are encouraged to gather knowledge and share it with their peers and teams.

Expertise and access to experts: Via job rotations, cross-functional projects and other methods the organization should facilitate the transferring of knowledge across boundaries and also allow enhancing the knowledge and expertise.

Communities of Practice: Helpful for posting issues, solving problems and discussing key topics. Members of the community could meet in person or otherwise, or use collaboration tools, such as message boards, chats, web boards, discussion forums etc.

Real-time information: It is very important to provide information to the right people, in the right format and in the right period of time.

Knowledge of organization depth and scope: Simply gathering volumes of data is not useful unless this is coded and stored in a way that makes sense to the people and makes it easy to retrieve.

Personalization and navigation of the system and interface: Having a possibly centralized system which is easy to use, to retrieve data and also to enter data helps in leveraging knowledge to the maximum since it is supportive to all, novice and expert users alike.

Difference between instruction and information: Organizations encourage sharing information using collaboration, mentoring and socialization. Instruction is information that is taught as part of on-the-job training, class room training or web-based training.

Lytras and Pouloudi come to a natural conclusion that a knowledge and learning management infrastructure is required in order to realize a knowledge organization as a learning organization with the capability to exploit the organization's knowledge wealth (Lytras & Pouloudi, 2003). Researchers suggest the following integrated model (Figure 20) for KM and learning convergence in a knowledge-intensive organization.

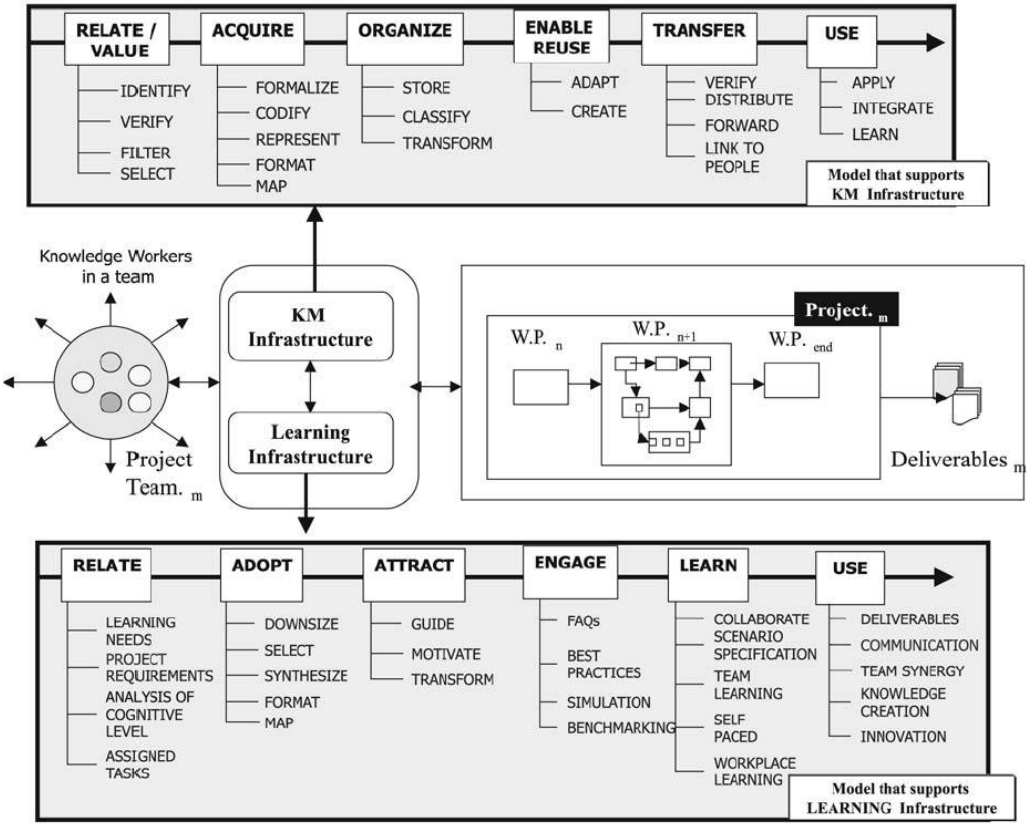


Figure 20. An integrated model for KM and learning convergence; Source: (Lytras & Pouloudi, 2003)

As mentioned already before an organization becomes a knowledge organization it must first establish the necessary channels of learning and ensure the properties of a learning organization. To upgrade this relationship between knowledge and a learning organization it is necessary to make it bi-directional in a way in which the e-learning strategy of an organization will take into consideration and satisfy the needs of KM. Learning practices and e-learning practices, as a popular form of learning, must cover specific training needs or problems; allow for content customization according to new discovered needs or a desired learning scenario; incorporate motivation mechanisms to enhance learners' participation to learning; develop engagement mechanisms; establish core learning processes capable of achieving different learning goals; and include different delivery modes in order to be able to support the daily business requirements of executives (Lytras, et al., 2002).

2.5.2. Organizational Memory (OM) and Organizational Memory Systems (OMS)

A set of repositories of information and knowledge that an organization has acquired and retains is its organizational memory (Huber, et al., 1998). OM is called upon and used as needed in present activities to bring about organizational effectiveness (Stein & Zwass, 1995). Organizational Learning (OL) takes place with the detection and correction of errors (Malhotra, 1996). Knowledge evolves from OM through experience and learning and it is context-specific. Thus, knowledge can be considered a subset of OM and KM a subset of OM processes (Jennet & Olfman, 2003). An OMS includes processes for identifying and capturing OM, OM repositories,

processes for storing, searching, retrieving, and displaying OM. The relationship between knowledge and organizational memory can also be explained if OM is seen as a way to extend and amplify knowledge, a key asset of an organization, by capturing, organizing, disseminating and reusing the knowledge created by its employees (Conklin, 2001). Thus, OM includes current knowledge manipulation and allows for new knowledge creation.

2.6. Conclusion

This chapter served as a summary of the literature review on KM and related terminology, benefits, practices, technologies, and popular approaches. Several KM methodologies and development processes were also described. The connection to learning, Intellectual Capital and Organizational Memory was made. Chapter 3 follows with a closer examination of research and other output focused on KM and higher education.

[3]

Knowledge Management in Higher Education

This chapter presents and examines a more focused review of available literature relevant to KM and Higher Education.

"A little knowledge that acts is worth infinitely more than much knowledge that is idle" -- Khalil Gibra

CHAPTER 3: KNOWLEDGE MANAGEMENT IN HIGHER EDUCATION

3.1. Introduction

Chapter 2 has introduced knowledge management and related terms. In the current chapter the focus is on Knowledge Management (KM) and Higher Education (HE). The topic is covered mainly via the presentation of KM practices in Higher Education Institutions (HEI) as these are discussed in a number of cases and focused studies which are reported in the literature.

3.2. The Knowledge Economy

According to the Organization for Economic Cooperation and Development (OECD), knowledge-based economies are said to be economies which are directly based on the production, distribution and use of knowledge and information. Godin argues that, according to many authors, think tanks, governments and international organizations, we now live in a knowledge-based economy (Godin, 2008). In this post-industrial society, also known as the Knowledge Society, capital and labor have given their place to knowledge and information as the major structural features of the society.

Several studies have shown that knowledge has become vitally important to the economy. For example, Driouchi and co-researchers examined the impact of knowledge and its related variables on the economic performance of 56 countries, and their results indicated that knowledge is a key driver of economic growth and confirm that economic output and growth have been boosted as a result of the efforts that expand the knowledge base. In recognition of the role that knowledge plays in the modern society, the World Bank Institution introduced the term Knowledge Economy Index (KEI), which measures the extent of knowledge acquisition, creation, use and access in a given country (Driouchi, et al., 2006).

The knowledge-driven economy requires a shift in the business mind set, and suggests that there should be greater receptiveness to know-how, the ability to see commercial potential, eagerness to keep on learning at all levels in a business, and flair in spotting new customer needs and fresh business opportunities (U.K. Department of Trade and Industry , 1998).

Europe 2020 sets out a vision of Europe's social market economy for the 21st century by highlighting only three priorities. The first of these priorities called “Smart growth” is about developing an economy based on knowledge and innovation. “Smart growth means strengthening knowledge and innovation as drivers of our future growth. This requires improving the quality of our education, strengthening our research performance, promoting innovation and knowledge-transfer throughout the Union, making full use of information and communication technologies and ensuring that innovative ideas can be turned into new products and services

that create growth, quality jobs and help address European and global societal challenges." (European Commission, 2010)

3.3. The Role of HEIs in the Knowledge Economy

The role that universities are asked to play in a knowledge economy is that of an equal partner who along with the state and the industry, being the other partners, is asked to generate, and share knowledge to lead to knowledge-based economic development (Etzkowitz & Leydesdorff, 2000).

In an thorough document analyzing the strategic plan for the development of higher education in England from 2006-2011 (HEFCE, 2009) in the 57 pages of the document the work "knowledge" appears 62 times, an average of 1.08 times per page. The document adopts Lord's Dearing vision for higher education (HE) in which he identified the following four main purposes for HE:

- to inspire and enable individuals to develop their capabilities to the highest potential levels throughout life, so that they grow intellectually, are well-equipped for work, can contribute effectively to society and achieve personal fulfillment,
- to increase knowledge and understanding for their own sake and to foster their application to the benefit of the economy and society,
- to serve the needs of an adaptable, sustainable, knowledge-based economy at local, regional and national levels, and
- to play a major role in shaping a democratic, civilized, inclusive society.

The document goes on to set five core strategic aims: enhancing excellence in learning and teaching; widening participation and fair access; promoting employer engagement for the articulation of the desired skills and knowledge; enhancing excellence in research; and enhancing the contribution of HE to the economy and society. Two more cross-cutting aims involved: sustaining a high-quality HE sector; and enabling excellence.

For the accomplishment of these aims the plan sets out objectives and describes specific directions and activities. All seven aims are depicted graphically in Figure 21 which follows.

Figure 21. Core Strategic Aims of HE; Source: (HEFCE, 2009)

Knowledge and Knowledge Management as laid down in the definition: "Knowledge management is an organized and systematic approach encompassing knowledge processes such as creation, usage, storage, sharing, transferring and retrieving knowledge in order to improve business performances", come up in many of the above mentioned objectives and activities and help in the materialization of the aforementioned aims. To mention a few of these objectives:

Sharing knowledge effectively is often as important as the original research and scholarship. Professional practice in knowledge exchange can be the engine of economic and social regeneration, and the driver of business and institutional innovation. An example of best practice in this direction is the creation of Knowledge Transfer Partnerships (KTP) between the industry and academia.

Sustainable development in HE can be achieved through: the skills and knowledge that graduates learn and put into practice; research and exchange of knowledge through business, community and public policy engagement; and institutions' own business operations.

Quality enhancement can be achieved via the dissemination and take-up of knowledge and practice in learning and teaching within and across universities and colleges. National education centres such as the Higher Education Academy in UK should be supporting individual centres' efforts and should facilitate the sharing of good practice via established networks.

The shared aim of the countries of the European Union to develop a knowledge-driven economy requires a strong and innovative research base. Nations that thrive in the global economy should be capable of creating new knowledge and transforming this into commercial opportunities.

A compiled list of driving forces which formulate a need for a KM system in academic institutions includes:

- Knowledge is the most important asset of academic institutions.

- Participants in educational environments are often engaged in huge duplication efforts (Robson, et al., 2003) which may involve re-creating existing teaching materials, etc. This is especially true in relation to new adjunct faculty members.
- There is a sudden increase of available online teaching and learning material on campus.
- Excellence in teaching and in knowledge exchange, are as highly regarded as excellence in research (HEFCE, 2009).
- HE institutions aim at delivering lifelong learning.
- There is a need to deliver HE to, and widen the participation of, under-represented groups.
- A truly competitive knowledge-based economy and an open inclusive society are knowledge intensive.
- There is a need to enhance quality by the dissemination of knowledge and practice in learning and teaching across universities.
- There is a need to share good practice through networks which will connect all parties concerned within an institution, between institutions, and between them and the society.

It has been more than ten years ago that researchers such as Kidwell and co-researchers outlined significant opportunities for academic institutions to apply knowledge management practices to support their mission (Kidwell, et al., 2001). With the convergence of e-business and KM using portals, it is possible to extend the organization's communities to include the customer in the generation and exchange of knowledge and thus gain an effective competitive advantage (Kidwell, et al., 2001). Ten plus years later, have things shaped up the way these researchers expected?

Over the last decade, the educational arena has been evolving with many academic institutions being nowadays involved in the development and use of computer-supported cooperative work systems or e-learning systems (Ainslie, 2005), (Thorn, 2001). It is obvious that the use of Information and Communication Technology (ICT) is contributing to shape the way of how and where teaching and learning are taking place (Breiter, 2004). The majority of universities have initiated development and adaptation of information system applications for educational purposes. Faculties have been encouraged to digitize their instructional materials and to use the provided information systems for interacting either with the administration or with the students (Seufert, 2002). Most HEIs are introducing e-learning courses in their mainstream education and some are offering entire e-learning degree programs alongside to their traditional education. At the same time e-learning platforms such as Coursera, Stanford Online and others may not yet be issuing academic degrees but the courses they offer and the awarding of completion certificates is

definitely gaining ground and popularity among e-learning followers. Whereas until recently KM has not been a high priority for higher education (Arntzen, et al., 2009), some HEIs have now moved to the other extreme of developing the ambition of an e-campus (Thorn, 2001). There is a growing recognition that the wide adoption of ICT, internet, intranet, and instructional software applications on campus, along with knowledge management practices can enable higher education to evolve more smoothly to a highly interactive and dynamic educational environment (Robson, et al., 2003), and at the same time a highly open and dynamic knowledge-based environment. ICT paves the road to providing lecture anytime, anywhere and/or to motivate, improve, and enhance the communication between faculty, staff and students.

Allowing the traditional teaching styles and methods to evolve alongside to the environment in which education is delivered might be necessary but this movement is not unopposed. The issue has raised debates on how higher education could cope with the new changes and thus introduce an innovative approach in the way teaching and learning processes are performed.

Additionally, the explosion of digital content and online resources has contributed to the rise of new challenges that higher educational institutions need to face (Abdullah, et al., 2005), (Van Merriënboer & Brand-Gruwel, 2005). These issues are related to the identification of methods or technologies supporting the processes of acquiring, storing, organizing, disseminating, searching, indexing and retrieving efficiently and successfully the available knowledge. This in fact is the functionality expected of KM which now comes in context. There is no guarantee that ICT will be fully utilized and exploited by faculty. To the contrary, it is recognized that there is rather a latent or open hostility from some teachers or administrative staff to exploit fully the functionality of information systems (McDermott & O'Dell, 2001). At the same time it should not be alleged that ICT with its numerous advantages does not also pose some limitations which need to be identified and addressed. Managing available knowledge within academic institutions is definitely the right way to go if the ultimate aim is to achieve a knowledge-based economy.

For some nations, knowledge and its management constitute strategic pillars for their educational and broader economic development. One such case is that of England the strategy of which is analyzed by the document prepared by the Higher Education Funding Council for England (HEFCE, 2009). Another such nation is that of Thailand with the authority responsible for setting the national strategic policy framework on national education, the Thailand Ministry of Education, launching a 15-year long range plan on higher education (2008-2022). In the report (Thai Office of the Higher Education Commission, 2008), the Thai government puts prime importance on the creation of a knowledge-based society and instructs all public universities to develop knowledge management systems for research and innovation for institutional development and transformation into learning organizations.

3.4. KM Practices in HEIs

HEIs are about 'sharing knowledge'. Undoubtedly, for all of them their mission will include providing quality teaching and research activity. Further to their primary role to educate and do research thus, contribute to innovation, universities engage on different levels with the public and other associated institutions and organizations both at the national and the international level. Universities, according to Boulton and Lucas, can also be part of the process of producing a successful knowledge economy (Boulton & Lucas, 2008).

A second priority, both for non-for-profit and for-profit HEIs is to ensure effective and efficient management and administration within an increasingly competitive market. Globalization and fierce competition force HEIs to think about the way in which they teach, conduct research and manage the institution and its various stakeholders. They should therefore be prepared to incorporate management methods and models from the business world to ensure an ability to respond to change effectively and efficiently; one such business management tool is knowledge management. Effectiveness and efficiency in management is necessary and universities must practice it without contradicting their primary and expected role in the society which is not making profit, even for the for-profit institutions, but offering a vital service to the society.

Considering the role of HEIs over the years, this has undergone substantial change to be mostly attributed to the fact that whereas in the past higher education was for the few who selected to pursue a higher education degree at the undergraduate level and the even fewer who would go for a post graduate degree, nowadays, things have changed with the majority of high-school leavers continuing their education at the university. Additionally, advancements in information technology (IT) and educational technologies more specifically, have enabled the globalization of education and allowed for the accessibility of education and university-offered services, remotely such as in the case of e-learning and distance learning practices. In the 21st century HEIs: a) help to create the knowledge, skills, and values that underpin a civilized society; b) can transform the lives of individuals substantially; and c) drive innovation and economic transformation (Browne, 2010).

"In our modern knowledge based economy", wrote Stankosky, "knowledge assets are the tools with which today's industries need to function. Consequently, KM must be given a priority position in our educational and training systems." (Stankosky, 2005) He was of course referring to KM as an academic discipline and the introduction of related programs of study in higher education. A simple search performed at this point of the study (2013) among UK universities revealed fewer than fifteen courses on KM, all offered at a postgraduate level.

Knowledge in a HEI exists in two forms; the academic knowledge which is the knowledge the institutions are expected to share with the society, and the organizational knowledge which a HEI

just like any other organization has and it involves its functioning as a business. KM has multiple benefits to offer to a HEI as an organization. Amongst other benefits one may include according to Milam that KM will enable universities to increase student retention and graduation rates, retain a technology workforce, expand Web-based offerings, analyze the cost-effective use of technology, and do other things necessary to compete in an environment where institutions cross state and national borders to meet students' needs (Milam, 2001).

Assuming that the intellectual capital of a university must be reaching the highest levels of excellence and does not require any kind of interference it does not mean than in reality this is actually the case. In fact, today's universities are slow to innovate (Fazlagic, 2006). This may explain why on the practice of KM by higher education institutions not as much has been published in literature. A few case studies are available to inform us about current practices. For example an article by Arntzen and co-researchers discusses KM practices at Bangkok University (Arntzen, et al., 2009). Petrides and Nodine report that several educational institutions across the USA have received grants to implement KM practices (Petrides & Nodine, 2003). They mention a few, being: the Cuyahoga Community College in Cleveland, Ohio, the Jackson State University in Jackson, Mississippi, and the Foothill De Anza Community College District, in Cupertino, California. They also refer to some KM projects e.g. the Model Secondary School Project. Ramachandran and co-researchers investigated the practices of KM processes in public and private HEIs in Malaysia (Ramachandran, et al., 2009). Their research findings suggest that all the six KM processes (knowledge creation, capture, organization, storage, dissemination, and application) are moderately practiced by the institutions surveyed, and that there are significant differences in the overall practices of KM processes between the public and private HEIs.

One area of omission in knowledge intensive studies is within higher education/research where there is the virtuous circle of teaching, research and consulting professional work (Oliver, et al., 2003). Nevertheless, the absence of a considerable amount of literature relating to KM practices in HEI does not suggest absence of such practices. In fact, Cranfield and Taylor claim that universities in general, and UK HEIs in particular, do have a significant level of KM activities (Cranfield & Taylor, 2008), which Rowley contends is important to recognize and use as foundations for further development (Rowley, 2000). Cranfield and Taylor performed a case study between seven HEI in the UK. According to their study, two HEIs were engaging in KM in a systemic and institutional-wide way, and a further two had champions engaging in KM overtly within their faculty (Cranfield & Taylor, 2008).

A different study was deployed in the North Vancouver School District in Canada (Glickman, 2004) between 42 organizations ranging from elementary schools to secondary schools and a residential centre. The study concluded that even though many of the studied organizations did not know or use the term "knowledge management", they used many knowledge instruments. The strategies

that the district and schools have put in their plans represent a sophisticated "Know How" approach to leadership and change. However, these were hampered by the fact that the existing information systems and supervisory practices were not considered adequate. On a scale of three, in which Stage 1 is the knowledge-chaotic stage, Stage 2 the Knowledge-aware and Stage 3 the Knowledge-enabled stage, Glickman concluded that the North Vancouver School District was at Stage 2 (Glickman, 2004).

After investigating the role of the Academic Board and the University Council in an Australian university, Blackman and Kennedy concluded that in the case studied, the type of knowledge targeted was narrow and committee members were focused on processes that did not effectively enable the creation or transfer of knowledge (Blackman & Kennedy, 2009). What knowledge do we require in order to understand the possible futures so that we can pursue strategic goals? What knowledge manipulation processes allow us to create, develop, and utilize that knowledge? These questions set the requirements for effective governance (Blackman & Kennedy, 2009).

HEIs should deploy KM practices to support every aspect of their mission – from education to public service to research. An institution-wide approach to KM can lead to exponential improvements in sharing knowledge, leverage the knowledge capital and enable the organization to become more effective (Laal, 2011). Blackman and Kennedy claimed that strategic success in the university is dependent on deeper understandings of the nature and role of knowledge management (Blackman & Kennedy, 2009).

3.5. Previous Studies of KM in HEIs – Lessons Learned

In an attempt to gather as many previous studies, as possible, with emphasis on case studies, on knowledge management practices in higher education with the objective to learn from the experiences of other researchers who also focused on the area, the following findings were possible.

Higher education institutions have "significant opportunities to apply knowledge management practices to support every part of their mission," supports Kidwell and co-researchers (Kidwell, et al., 2001).

A key finding from the survey of knowledge management practices conducted in an Australian university revealed a variance between the perceived importance and implementation, with lower scores obtained for participants' perceptions of the implementation of knowledge processes and their socio-technological enablers, as compared to their perceptions of the respective importance of the same knowledge processes (Oliver, et al., 2003).

A study by Basu and Sengupta (Basu & Sengupta, 2007) on the factors which are important for the success of an educational organization in terms of KM or organizational learning, considered the

following: Integrated technical infrastructure including networks, databases, repositories, computers and software; An organisational culture that supports learning, sharing and use of knowledge; Motivation and commitment of users including incentives and training; and Senior management support related to resource allocation, leadership and providing training. Though their study was exploratory in nature and it only involved one specific institution, the results of Basu and Sengupta, revealed that an integrated technical infrastructure, the organizational culture, motivation and commitment of users, and senior management support all proved to be very important factors for KM implementation success (Basu & Sengupta, 2007).

Ganesh also studied the knowledge management environment and found that only by developing the necessary organizational culture, can an organization gradually change the pattern of interaction between people, technologies, and techniques, because the core-competencies of an organization are entrenched deep into organizational practice (Ganesh, 2001).

Another study was conducted to examine knowledge sharing behaviours among academics in a knowledge-based institution, being a university. The study focused on the factors which may affect the willingness to share knowledge. Organizational, individual and technology factors were examined and the overall findings revealed that incentive systems and personal expectations are the two key factors in urging academics to engage in a knowledge sharing activity. In particular, regarding incentive systems, "forced" participation which was attempted did not work as expected and appeared to be an ineffective policy in cultivating a sharing behaviour among academics. Instead, academics responded to a performance-based incentive system and the general conclusion was that it is important to provide the "right" incentive system and understand individual's expectations towards knowledge-sharing in order to facilitate a knowledge sharing behaviour (Cheng, et al., 2006).

Knowledge, and experience of course, is power. Knowledge is what defines an academician and this is not just the knowledge which one has acquired over years of education and years of teaching experience but is equally the knowledge that an academician has generated through his/her research activities. This understanding alone may be explaining why it may be difficult for some academicians to share their knowledge.

In a study done by Alotaibi and co-researchers to investigate the factors that affect academics' behaviour towards knowledge sharing by using Web technology, the authors have been able to identify the factors shown in the figure below as the most important in shaping staff's behaviour (Alotaibi, et al., 2014).

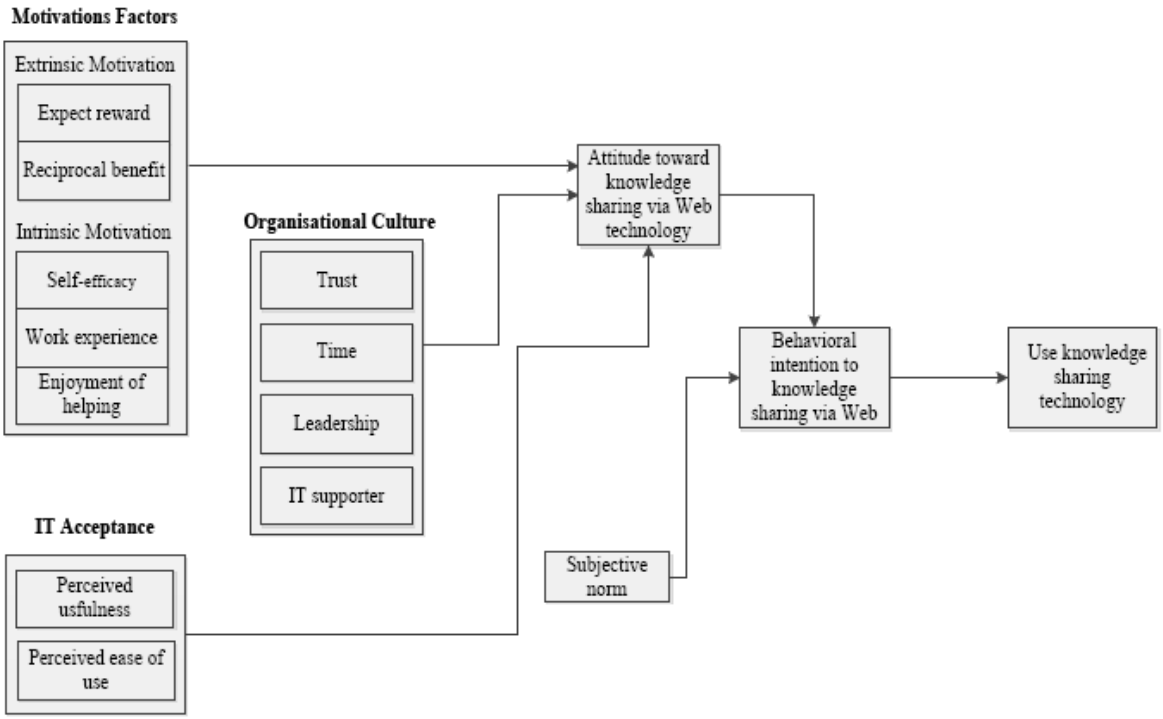


Figure 22. Factors that lead to successful adoption of knowledge sharing technology; Source: (Alotaibi, et al., 2014)

Though not explicitly addressed in the literature as either a barrier or an issue which requires regulation, the Higher Education Funding Council for England (HEFCE) commissioned a study on the issue of intellectual property (PACEC and the Centre for Business Research at the University of Cambridge, 2010). The study showed that 19% of the academics in the top 6 high research HEIs felt that intellectual property and other issues relating to the terms of interactions of knowledge exchange nature with external organizations could act as a barrier for their knowledge exchange interactions. In particular, these concerns were primarily raised by academics in the science, technology, engineering and mathematics disciplines.

Different key approaches for knowledge retention and transfer as well as technologies and tools used for the same purpose were discussed in Chapter 2. Below, some of these approaches and tools are revisited with experiences resulting from their use in HEIs as these are reported in the literature.

E-Learning

Regarding the use of specific KM practices in HEIs, E-learning, one of the most important KM practices, though it is of course utilized by universities as a mode of delivering education to students it is not equally used for employee education (Milam, 2001). This comes in opposition to the findings of a study between 700 companies. This Delphi Group study revealed that about two thirds of these companies use online resources for training employees (Lloyd, 2001).

Community of Practice (CoP)

Another way to share knowledge is through a community of practice (CoP). As suggested by Buckley knowledge sharing within communities also presents its challenges (Buckley, 2012). According to the same study these challenges include a lack of trust, a lack of incentives and a poor culture of learning in an organisation. Additionally, there is also too little time to devote to knowledge sharing, and there may be issues relating to rewards and recognition. The same study suggests that two factors that appear to play an important role in the effectiveness of knowledge sharing are the attitudes of the academics and participation by management. Buckley, emphasizes that if academics simply view 'knowledge as power', then knowledge sharing cannot be practiced effectively. However, if management takes action towards promoting CoPs, academics' stance may be revised to 'knowledge sharing is power'. This can only be achieved if, according to Buckley if management enjoys the trust of academics which can only be achieved by showing a genuine interest in academics and recognizing their extra efforts, rather than adopting the attitude 'you are paid to create knowledge' (Buckley, 2012).

In a case study by Shukla the author claims that if KM is done correctly, it can lead to better decision-making capabilities, a reduced "product" development cycle time (for example, in relation to curriculum development and research), improved academic and administrative services, and reduced costs. The author describes a KM implementation in a HEI by referring to specific KM applications and their benefits for various administrative units in the HEI (Shukla, 2012).

Galbreath suggests moving from the narrow scope to the general scope of KM implementation, thereby starting the development of a learning community from the individual to move on to creating departmental knowledge, creating domains of knowledge across departments that share academic interests or disciplines, and finally creating institutional knowledge networks with other institutions and corporations and the society (Galbreath, 2000).

Chen and Burstein suggest a dynamic model of knowledge management for higher education development which includes six knowledge management activities for capturing, storing, sharing, learning, exploring, and exploiting knowledge related to a particular task. Chen and Burstein highlight the importance of addressing people, policy, and technology as important factors in any KM management strategy and list eighteen essential steps for the process leading to an effective knowledge management implementation (Chen & Burstein, 2006).

Witt and co-researchers inform the reader about The Higher Education Learning Partnerships Centre for Excellence in Teaching and Learning (HELP CETL) which is part of a national network of 74 CETLs which are funded by the Higher Education Funding Council for England to reward excellence in learning and teaching and to promote educational research (Witt, et al., 2007). As

part of a five year project to build on existing excellence of the University of Plymouth Colleges (UPC) partnership (established in 2003; includes nineteen further education colleges) a Community of Practice framework was employed as the key communication and information sharing tool. The Knowledge Exchange Network which was created provides features designed to enable staff involved in the delivery of higher education foundation degrees to share ideas and experiences. At the time of writing the specific article, 21 communities had already been created and had been active.

Communities of practice (CoP) have also been used in the study by Buckley and Giannakopoulos. Their conclusion was that sharing knowledge within communities is complex since it involves such challenges as a lack of trust, a lack of incentives and possibly a poor culture of learning in an institution. In particular, their study which involved academics found that this group is willing to share knowledge but time constraints, an unwillingness to share knowledge, and a lack of support or participation from management may become obstacles to knowledge sharing (Buckley & Giannakopoulos, 2011).

3.6. Definition of and Approach to a "Holistic Solution for a KM Implementation"

Different KM researchers have addressed and examined different aspects of KM. A summary of the most important research findings in the area has been presented in Chapters 2 and 3. Additionally, businesses attempting to apply KM in their practices have reported their experiences, both positive and negative in the literature in the form of lessons learned. Best practices available by some of the pioneering firms in KM implementation are of particular interest and have been examined along with all other lessons learned. Extra attention was given to any account of KM implementation in HEIs.

Thus, gathering together and amalgamating all of the above reported knowledge has made it possible to establish the meaning and context of a holistic, with the meaning of spherical, solution for a KM implementation and what this should entail. Such a solution would involve a number of business areas which are considered as critical for the success of a KM effort.

Hence, a holistic solution for a KM implementation is one that will engage all aspects of the business hand in hand with the different knowledge dimensions. For such a solution to be successful it is required to sufficiently examine and satisfy all of the critical success factors being, the organizational structure, strategy and leadership, technological infrastructure, culture, organizational processes, and measurement. In the concerned organization the pursued KM structure, systems, technology, and skills should all be in alignment with the organization's goals and direction.

The different KM processes and frameworks which were examined (section 2.3.3.) have all contributed to an understanding of the approach a business should take towards implementing KM. The majority of these frameworks agree that the effort towards successful knowledge utilization must address business issues, human, technological, and knowledge factors (David Skyrme Associates, 2014) (Wiig, 2004) (Girard, 2005) (O'Dell & Grayson, 2004) (Huang, 1998) (Oliver, et al., 2003) (Stankosky, 2005).

To finalize the approach I would propose and follow for implementing a holistic KM solution, I tried to combine the knowledge offered by the different KM experts, with the experiences and advice of different businesses who worked on implementing KM practices. Having established that a knowledge organization has to be a learning organization and that knowledge and learning must coexist, I decided to include in my investigation the aspect of exploring the HEI's learning practices along with investigating its KM practices. Thus, the first step, as in any problem based enquiry, concerned conceptualizing the problem and any opportunities available by investigating the "as is" situation within the institution. At the same time I needed to consider the needs and expectations of the stakeholders alongside with their capabilities and opportunities in order to come up with the desirable "to be" situation. In the composition of both activities I should include and give emphasis to the six critical success factors defined in the "holistic solution for KM" as these could suggest either success or failure of the project. A more detailed description of the approach followed is given in section 4.4. Research Design.

In Chapter 4 I describe how I have incorporated the investigation of the critical success factors in the survey and other activities. Following an analysis of my findings from the first two activities I should then be able to give advice and make recommendations regarding future action towards KM implementation. Finally, following my findings and emphasizing on their applicability to HE, I decided to select a potential area of KM implementation within the HEI and proceed with implementing KM practices while documenting all of the activities so as to be able to repeat them in the future to expand KM use in the organization (see Chapter 7).

3.7. Conclusion

Albeit, the body of literature for KM is substantial, with the number of focused and other journals and articles addressing KM issues growing (Prusak, 2001) on the practice of KM by higher education institutions not as much has been published in literature. A few case studies and other publications exist to inform us about current practices in the application of knowledge management by Higher Education institutions. Nevertheless, Stankosky contends that many organizations all over the world have changed their organizational structure by creating KM departments and creating a Chief Knowledge Officer position, and suggests that educational organizations have recently begun to understand the importance of those changes (Stankosky,

2007). With no specific survey outcomes to support this statement the viewpoint cannot be generalized.

As was the objective of this chapter to present the findings of this focused literature review, the chapter outlined the role of HE and HEIs in the modern knowledge economy and addressed knowledge management practices by HEIs for the attainment of improved organizational effectiveness and efficiency. Through the cases and studies presented herewith, a number of KM practices were considered and lessons learned both in terms of successes as well as inhibiting factors were outlined.

In conclusion of the literature review it was made possible to define the holistic solution for a KM implementation and suggest a process towards attaining the desirable results and therefore enjoying the benefits of KM.

Section II

The Research Methodology, Data Collection, and Analysis

Chapter 4 –Research Methodology; Plan and Execution

Chapter 5 – Research Findings, Analysis and Discussion

[4]

Research Methodology; Plan and Execution

This chapter sets out the research plan of the present study.

"The only source of knowledge is experience. Learning is experience. Everything else is just information." -- Albert Einstein

CHAPTER 4: RESEARCH METHODOLOGY; PLAN AND EXECUTION

4.1. Introduction

This chapter describes briefly the epistemologies, methodologies and tools used in order to satisfy the objectives of this research study; describes the research design; and follows through the execution of the research activities relating to data collection and data analysis.

4.2. Selected Epistemologies, Methodologies, and Tools for This Study

Epistemology is the branch of philosophy that studies the nature of knowledge, its presuppositions and foundations, and its extent and validity. By considering the specific characteristics of each epistemology, a researcher is required to select the one(s) that are most applicable to use in each particular research study. Epistemologies are then paired with research methodologies. A *research methodology* is the general plan of what has to be done in order to answer the research questions set. It addresses issues such as the specific sources from which data will be collected, constraints to be encountered, as well as research tactics, such as data collection and data analysis methods to be used (Saunders, et al., 2003).

The aim of the study was to create a framework for KM implementation in a HEI. The whole study was approached using a problem based enquiry. Since the nature of the study was work-based I decided to use a stakeholder approach. I expected that this way I would be able to gain a deeper and broader understanding of the functioning of the HEI in relation to KM by involving the stakeholders at all areas (both administrative and academic) and all levels of the organization. While exploiting all areas required for a successful introduction of KM in a HEI, the study aimed at delivering a KM solution which would satisfy the main stakeholders, i.e., the administration, faculty and staff members. The stakeholders' group could be broadened to include the students and the public community, appreciating the benefits that a KM implementation would have in boosting the institution's role in the community. The case study outlines a framework for KM implementation in HE and presents a suitable methodology for such an implementation which addresses all of the necessary aspects. The case study can show the way to new KM implementations in the HEI in the road to an organization-wide adoption of KM.

In order to address the research question and achieve the aims and objectives of the study a specific research plan was developed following a problem based enquiry approach. This is described in detail in the sections which follow.

This study had an exploratory nature as it intended to explore the HEI's stakeholders' perceptions of the "knowledge organization", and their current practices including strategy, leadership style,

and culture. Further to this exploration, the study made recommendations to the HEI regarding the leadership style, organizational structure and culture necessary for a positive KM environment, and described principles and practices needed to ensure that individuals may collaborate and share knowledge. Such practices include embedding information and communication technology in the organization workflow. To satisfy these requirements the study needed to strengthen its descriptive attributes. As for the description of the experience of implementing KM in the HEI, an explanatory approach was followed in order that the whole effort and the necessary accompanying explanations would form a re-usable case study.

The first part of this research study (exploratory) which investigated the KM practices and a KM-enabling environment in the specific HEI cannot be viewed as a universal truth, thus, the output of the study would not form some law-like generalization. This component of the study was rather based on beliefs, attitudes, and practices of the members of the HEI under study. Such research is best approached using the interpretivist/hermeneutic paradigm which introduces the concept of paradigm to describe the beliefs, values, and techniques shared by members of a given community (Kuhn, 1970).

The second component of this research study (explanatory) involved examining all the necessary components for a successful KM implementation and suggesting such an implementation in a HEI. The KM case written at the end could be applicable to other organizations similar to the one under study. Since some generalization of the research results can be made from this section of the research, the study was seen as sharing certain characteristics with the positivistic/empiricist philosophy as well.

Finally, according to Gill and Johnson's classification of methodologies [see Table 4 by (Gill & Johnson, 2002)], the present research has similarities with action research, being research which is mostly prescriptive, deductive, obtrusive 'from the inside', and mostly concerned with utilization.

Table 4. Classification of Methodologies; Source: (Gill & Johnson, 2002)

Prescriptive, deductive, obtrusive 'from the inside'	Analytical Surveys, Experimental Research Design (concerned with precision)	Action Research (concerned with utilization)
Descriptive, inductive, unobtrusive 'from the inside'	Descriptive Survey Research Design (concerned with generality)	Ethnography (concerned with character of context)
	General, extensive	Particular, intensive

Having identified the epistemologies appropriate for the specific research study, case studies and surveys were selected. The reasons for the selection of the particular methodologies were that

these have been identified as tools: (a) offering for use in both an interpretivist/hermeneutic (qualitative) as well as positivist/empiricist (quantitative) research strategy [See Table 5. Epistemologies and Associated Methodologies (Hussey & Hussey, 1997)]; and (b) as most appropriate for work-based projects, such as the present study paradigm [see Table 6. Selected Research Methodologies and Tools Appropriate for Work-based Projects (Middlesex University, 2006)].

Table 5. Epistemologies and Associated Methodologies; Source: (Hussey & Hussey, 1997) adaptation

Positivistic/Empiricist Paradigm (Quantitative)	Interpretivist/Hermeneutic Paradigm (Qualitative)
Cross Sectional Studies	Action Research
Experimental Studies	Case Studies
Longitudinal Studies	Grounded Theory
Surveys	Ethnography
Mechanical Observations	Feministic Perspective
Simulations	Hermeneutics
Action Research	Focus Groups
Case Studies	Individual Depth Interviews
	Human Observations
	Soft Systems

Table 6. Selected Research Methodologies and Tools Appropriate for Work-based Projects; Source: (Middlesex University, 2006)

Research Methodology	Research Tools				
	Documents	Observation	Interview	Questionnaire	Other (specify)
Ethnography	✓	✓ Participative	✓		
Action Research	✓	✓	✓		Workshops, Focus groups
Case Study	✓	✓	✓	✓	
Soft Systems	✓	✓	✓		
Experiment	✓	✓			
Survey	✓		✓	✓	

These methodologies would be served by the following research tools:

- Focus groups, individual in-depth interviews, questionnaires, and documents. Questionnaires were used to collect the quantitative data required for the survey and the case study. Focus groups and individual interviews were selected for use for additional qualitative in-depth data collection. Documents were collected for the needs of a literature review. Additional workplace documents were also collected.

The identification of different epistemologies appropriate for use leading to a number of methodologies and research tools being put in place for the purposes of completing the present research study all formed a practical use of methodological triangulation. Data triangulation was also feasible via the collection of data from several stakeholders. Other forms of triangulation

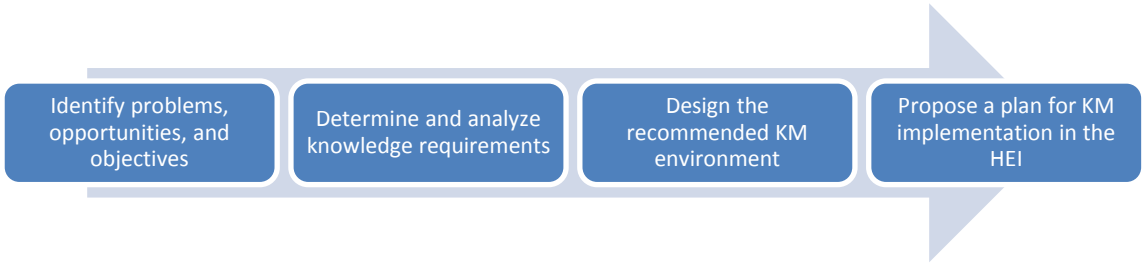
were not appropriate. These involve investigator triangulation which was rejected since in the present study I was working alone. Triangulation of theories was not valid because this research did not involve contradicting theories. On the contrary, KM is formed as a multi-disciplinary area which brings together research findings from business, information science, and social science studies.

A more detailed examination of the selected methodologies and the particular research tools which were utilized follows.

4.3. Further Examination of the Selected Research Methodologies and Tools

Problem Based Enquiry

The purpose of this research was to explore the implementation of Knowledge Management in a Higher Education Institution. The project was approached using a problem based enquiry whereby the following steps were executed:



The study of the HEI and its practices was completed using surveys whereby both the quantitative as well as the qualitative data collected allowed me to conceptualize the problem and the opportunities which were present. A case study was written to describe the whole experience of implementing KM in a specific practice area of the HEI.

4.3.1. Research Methodologies

Surveys

The survey strategy is a common and popular strategy used in research that allows the collections of standardized data from a sizeable population (Robson, 1993) and which is generally perceived as an authoritative research strategy (Saunders, et al., 2003).

Appropriateness of Surveys for This Research Study

In the present study, data regarding the HEI's stakeholders' perceptions of the "knowledge organization", their current practices including strategy, leadership style, and culture were collected primarily from the employees (including administrators) of the institution. Some additional data were also collected from the students of the HEI. The use of the survey strategy was appropriate for this study as it provided the opportunity of converting significant variables,

such as people's perceptions, beliefs, and expectations for KM, into numerical values so that they could be translated into strategies, policies, and action by university management. The use of the survey strategy also gave me the opportunity to control the research, and collect data in an economical way, using questionnaires, which allowed easy comparison of the quantitative data collected in order to address this research's objectives.

Questionnaires were used for the collection of quantitative data while interviews and focus groups added complementary qualitative data to the survey.

Both methodologies, case studies and surveys, actually followed a problem-based enquiry approach focussing on the implementation of KM and the diffusion of KM-achieved efficiencies within the HEI. In fact, this problem-based enquiry shared certain characteristics with action research in that it involved the co-generation of new information and the production of tangible and desired results for the people involved (Blaxter, 2001) and it definitely combined both action and research (Cohen, 2000). Furthermore, as in participatory action research where the researcher stimulates and guides the process (Whyte, 1991) and people work towards the improvement of their own practices, in the present research, the organization which was being studied was my employer and the environment in which action was sought was the same organization. This provided me, as a practitioner researcher, my colleagues and other involved stakeholders of the HEI with the opportunity to become generators of knowledge and initiators of action, rather than mere implementers of policy.

The enquiry was completed with the examination of several documents published by the institution; the utilization of in-depth interviews with top executives; and the activation of focus groups to collect additional qualitative data from staff and faculty.

Case Studies

A case study as a way of doing research is used in many situations to contribute to our knowledge of an individual, a group, an organization and relation phenomena (Yin, 2003). It is viewed as a specific instance that is frequently designed to illustrate a more general principle, and it provides a unique example of real people in real situations; it is therefore considered an empirical approach. The term "case" may refer to an organization, individual, group, situation or whatever is being studied (Robson, 1993). It is not so much a specific technique but rather a way of organizing social data so as to preserve the unity of the studied object (Goode & Hatt, 1952). Furthermore, in a case study research the researcher does not only aim to explore a specific phenomenon, but also to understand it within a specific environment (Yin, 2003). As a research approach, the case study is ideally suited to the resources and environment of a work-based researcher (Middlesex University, 2006).

Stenhouse and Rudduck identify four kinds of case studies: (a) an ethnographic case study – single in-depth study; (b) action research case study; (c) evaluative case study; and (d) educational case study (Stenhouse & Rudduck, 1985). Stake on the other hand lists three different types: (a) intrinsic case studies - studies that are undertaken in order to understand the particular case in question; (b) instrumental case studies - examining a particular case in order to gain insight into an issue or a theory; (c) collective case studies - groups of individual studies that are undertaken to gain a fuller picture (Stake, 1994).

Appropriateness of Case Studies for This Research Study

In this research, the case study approach was considered appropriate for writing up the whole experience of implementing KM in a HEI. Such a case study was seen as important and potentially useful to other similar organizations when considering implementing KM. The case study was identified as being an intrinsic type in which the organization under study is the employer of the work-based researcher. Top level management supported the specific KM investigation, study, and implementation and authorized me to carry out research appropriate to fulfil the particular research study's objectives. Furthermore, a case strategy was retained as it is believed that the operations of a specific HEI represent the typical challenges that would also be faced by other HEIs. This case also has attributes of an instrumental case study in which the presented experience serves as a model for gaining insight into the theory of KM and its implementation in a HEI. It can also qualify for an action research case study since the researcher (myself) empowered by a long service in the organization, was actively involved in the research which was primarily undertaken to promote positive change. Finally, the case study provided the general framework which was combined with other research methodologies in order to achieve the set objectives.

The write-up of the case study which describes a KM implementation in the HEI was made possible by combining knowledge collected via all of the established used methods in the present study.

4.3.2. Research Tools

Focus Groups

Focus groups are generally used to assemble data relating to the feelings and opinions of a group of people who are implicated in a common situation (Hussey & Hussey, 1997). The use of focus groups is considered by many research experts to be quite valuable since they combine both interviewing and observation, and they may become the developmental basis for the generation of survey questionnaires or interview schedules (Hussey & Hussey, 1997). The group interaction

created in focus groups produces data and insights that would be less accessible otherwise (Morgan & Smircich, 1980).

Focus group research involves an organized discussion with a selected group of individuals to gain information about their views and experiences of a topic (Gibbs, 2000). The particular research tool can be seen as a special form of group interviewing that relies on the interactions within the group but where participants express their own views. The recommended number of people per group is usually six to ten. The role of the moderator is critical in providing clear explanations of the purpose of the group, promoting debate, asking questions, challenging participants, probing for details, etc. Moderators should avoid giving personal opinions while they should be good listeners and communicators.

Appropriateness of Focus Groups for This Research Study

Focus groups served the particular research study in offering for the collection of additional and more detailed data regarding the views and experiences of the focus group members. Two focus groups were formulated. The first one comprised faculty members from different schools of the HEI, at different ranks, and with varied experience at the current HEI. The second comprised members of the staff from different functional units of the HEI, again with a varied service time at the institution. The aim of allowing the focus groups' members to elaborate on the views regarding the current KM practices of the HEI and their views and concerns regarding future KM efforts, justified the use of focus groups in order to complement with some qualitative data the quantitative data collected during the survey.

Individual In-depth Interviews

Interviews constitute another popular method of collecting qualitative data. Interviewing is a method of collecting data where participants are asked questions in order for the researcher to determine what they think or feel about an issue at hand (Hussey & Hussey, 1997). The degree or structure of an interview is generally designed to be structured, semi-structured, or unstructured. According to Lincoln & Guba in the structured interview the questions to be investigated have been pre-formulated and the respondent is expected to address them with only a minimal diversion allowed. In the unstructured interview the questioning format is non-standardized and the problem to be investigated is not pre-formulated (Lincoln & Guba, 1985). The unstructured interview is highly flexible and encourages the interviewee to construct the account of the situation discussed or described and to introduce the notions of what s/he regards as relevant, instead of relying upon the researcher's pre-formulated notion of relevance (Pavlou, 2001). There is also the middle ground, the semi-structured interview, which is used when the interviewer needs to tailor his/her questions to the position and comments of his/her interviewer's

perspective and leave no room for alterations or change of structure to the respondents. Semi-structured interviews are open-ended, allow definition of terms before analysis takes place, and aim to explore what the interviewee thinks [Banister et al, 1994; Miller, Glassner, 1997; Dvale, 1996, cited in (Pavlou, 2001)]. At the same time focused semi-structured interviews allow the interviewee the time and scope to talk about his/her opinions on a particular subject. The focus of the semi-structured interviews is decided by the researcher along with the areas s/he is interested in exploring (Central, 2007).

Interviews can be executed in several ways, such as face-to-face, online, over the telephone and may involve an individual or a group of people. They serve well the needs of several methodologies such as surveys, soft systems, case studies, action research and ethnography.

Data collection through interviews is a very time consuming and expensive process, and processing and analyzing the data collected is more complicated than analyzing quantitative data. On the other hand, interviews, especially personal face-to-face ones, are a "process of open discovery" (Hussey & Hussey, 1997) and this is the strength of this data collection method.

Appropriateness of Individual In-depth Interviews for This Research Study

Individual in-depth interviews were used in this research study to collect the opinions, views, and experiences of top executives of the HEI in relation to current KM activities and future plans. Top executives also participated in the survey by completing the questionnaire distributed among all of the institution's employees but their opinions were regarded as highly valuable therefore in-depth interviews were seen as necessary for the collection of more qualitative data.

Questionnaires

Questionnaires are the research technique (tool) which dominates the survey approach but they can also serve other methodologies. The tool is used primarily for the collection of quantitative data.

Appropriateness of Questionnaires for This Research Study

Questionnaires, mostly online in form, were used for the collection of quantitative data from the entirety of the employee force of the HEI. These data concerned an investigation of the "as-is" and a conceptualization of the desired "to-be" situation in relation to the HEI's KM practices. The questionnaire was constructed after consulting a number of questionnaire instruments used in similar contextual surveys. A secondary smaller survey between the students of the HEI also involved the completion of online questionnaires.

Documents

A study of available literature (literature review) is required at the beginning of any research activity. For longer research activities such as a doctorate study such literature review may be necessary at different stages of the study. A review of documents also involves the review of workplace documents.

Appropriateness of Documents' Review for This Research Study

This research study being a doctorate project engaged me into a literature review at several stages of the study. Past research output and other documents which were collected and critically reviewed originated from a variety of sources and involved work in a very broad spectrum related to a number of research areas such as culture and organizational behaviour but also philosophy, economy and innovation. The common factor between them all was their direct or indirect contribution to the knowledge sought regarding knowledge management in higher education.

Workplace documents were also collected and studied as these were proofs of a lot of explicit knowledge available in the HEI under investigation.

4.4. Research Design

Following a problem based enquiry approach I outlined the following process to be used for conducting this research (see Figure 23). The six steps of the process are outlined below along with the specific objectives and the output of each step.

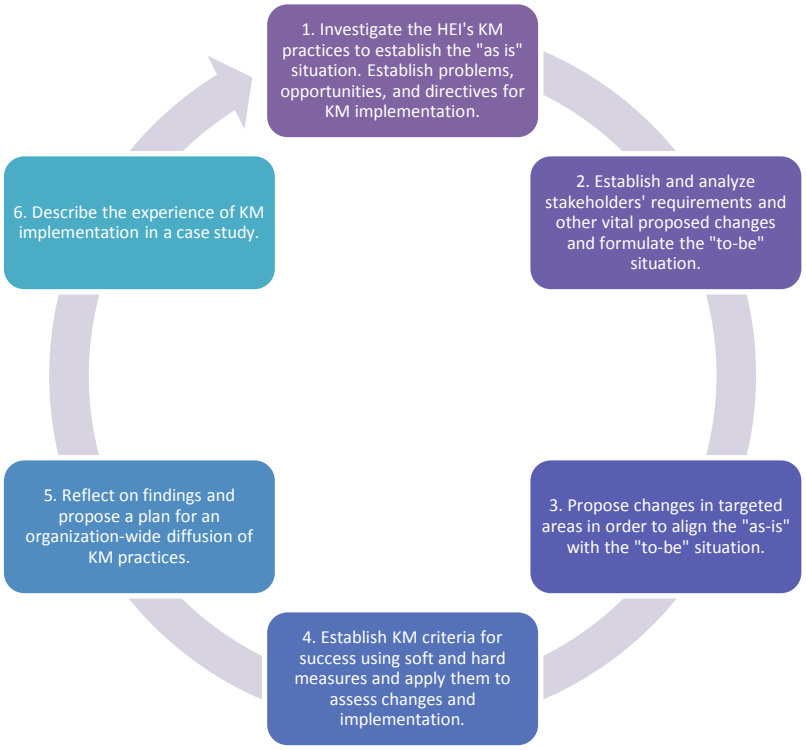


Figure 23. The Research Cycle of Activities

The first two steps of the cycle (see Figure 23) involved employing the questionnaire, focus groups, and in-depth interviews tools. The main survey objectives were the same for both the qualitative and the quantitative surveys which were conducted. The quantitative survey component was satisfied using questionnaires and the qualitative survey component involved activating focus groups and performing in-depth interviews. The evaluation of the obtained results from the first two steps along with the application of research findings and recommendations of other researchers, as these are reported in literature, allowed me to come to conclusions and make recommendations regarding short, medium, and long-term actions necessary to apply KM principles in the HEI's practices. Thus, steps 3-5 were completed. The last step described the experience of a KM implementation within the HEI. A case study was written to lead the way to other KM implementations which will follow.

4.4.1. Investigative Survey Activities

Review of documents

The project involved the on-going review of documents; an activity which was initiated at the beginning and was not completed up until the end of the project.

A comprehensive search for research output and other content which related directly or indirectly to KM was conducted by reviewing secondary sources of data such as articles, books, conference papers, software documentation and manuals, and the HEI's internal documents. The investigation and study was initially conducted at the beginning of the project in order to build a good and spherical knowledge base on KM. The study was retained throughout the project to

keep updated on new KM research output. The software review involved an examination of popular KMS and other relevant technologies and an identification of common and other features and functionality.

Survey Objectives

The main survey objectives were to identify current KM practices in the HEI, establish stakeholder's perceptions of the "knowledge organization", identify needs and opportunities relating to KM, investigate the "as-is" and formulate the "to-be" KM-friendly and implementation-positive environment. More specifically, the business practices of interest in this study were those used to support the collection, sharing, transfer, acquisition, and retention of knowledge by the institution and whether stakeholders found these practices effective.

The main stakeholders in this project were the educational institution itself represented by senior administrators, staff, and faculty members. Other stakeholders were the students and the public community.

Quantitative survey

Questionnaires are along with interviews the most frequently used data collection techniques. They may be used to collect data about attitudes, beliefs, opinions, characteristics, and perceptions of people. They may include either open-ended or closed questions.

Open-ended interview questions which allow interviewees to respond in a fairly unbound way provide the interviewer with breadth and depth on the researched issue. Though such questions may give richness of detail they may also produce too much irrelevant detail. Overall, open-ended questions may take too much time for the amount of useful information gained. Closed questions limit the number of possible responses. These questions are appropriate for generating precise, reliable data that is easy to analyze (Burgess, 2001). They may also be easier and faster for the interviewee to complete. Choosing one question type over the other involves a trade-off; although an open-ended question affords breadth and depth of reply, responses to open-ended questions are difficult to analyze. Closed questions are usually formulated with answers being put on a measurement scale such as the Likert-type, Thurstone-type, etc. Scaling is in fact the process of assigning numbers or other symbols to an attribute or characteristic for the purpose of measuring it.

Questionnaire questions should in general be simple, specific, short, not patronizing, free of bias, and addressed to those who are knowledgeable. All questions must be checked for validity and reliability. Validity is the degree to which the question measures what the interviewer intends to measure. Reliability of scales refers to consistency in response – getting the same results if the same questionnaire was administered again under the same conditions. Ambiguous, emotionally

charged, double-barrelled, embarrassing, complex, confusing, racist/sexist, (Zikmund, 2000) and leading questions should be avoided.

Employee Questionnaire

For the purpose of this study a questionnaire was developed following the literature review. Related studies were consulted and where appropriate utilized (Government of Canada, 2001); (Earl, 2003); (Alavi & Leidner, 1999); (Gold, et al., 2001); (Watkins & Marsick, 2003); (U.S. Government, 2014). The quantitative survey involved the main internal stakeholders, i.e. the staff and faculty members and the senior administrators of the HEI and allowed me to collect rich and detailed information very important for the study. More specifically the questionnaire enabled me to:

- formulate an overall description and develop the dimensions of a "knowledge organization", as identified by the stakeholders;
- establish current practices and performance ratings in relation to key KM practices (the "as-is" situation);
- identify the expectations, and importance assigned to each knowledge-necessary dimension by stakeholders (the "to-be" situation);
- compare the importance of KM practices with performance to assess KM readiness and satisfaction; and
- compare the importance of KM practices with the incentives behind their use as well as the HEI's performance against them in order to identify and prioritize areas for short- and medium-term action by the institution.

In the employee questionnaire (see Appendix B), questions were grouped into the following sections:

A. Classification/Demographics: Included relevant and appropriate general demographic background data to enable me to analyze the findings further, where needed.
B. KM Practices: Subdivided into policies and strategies; leadership and culture; incentives; knowledge capture and acquisition; training and mentoring; and communications, the questions asked in this section investigated KM practices at present time in the institution under study.
C. Importance of KM Practices: For the same KM practices investigated above the respondents were asked to indicate the importance they attribute to each practice.
D. Reasons for Using KM Practices: The section listed a number of possible reasons/incentives for KM practices in the organization. In relation to these, the respondents were asked to indicate the level of importance they attributed to each reason on a 4-point scale (Critical/Important/Somewhat Important/Not at all Important).

E. Results of Using KM Practices: KM performance was judged via a measurement of the effectiveness of the results of using KM practices in the organization. The section used a 4-point scale (Very effective, Effective, Somewhat Effective, Not at all Effective) to examine the level of effectiveness attributed by respondents to each of the listed results.
F. Group responsibility: To identify individuals/groups responsible for KM within the organization.
G. Learning Organization (LO) Practices: Subdivided into individual level, team or group level, and organizational level practices, the questions asked in this section investigated LO practices in the institution under study.

The questionnaire described above served for the collection of data from all of the organization's employees being staff, faculties, and administrators.

The survey was completely voluntary as were all of the questions of the survey. Thus, the "Don't Know/Not Applicable" option was possible via an empty reply in any particular question.

The employees of the HEI under study could select to complete the questionnaire either online or as a hard copy. There are slight differences in the numbering and sequence of the questions between the printed version (hard copy) of the questionnaire and the on-line version of the same questionnaire. These differences were mainly due to limitations of the tool used for the design of the online questionnaire; kwiksurveys, a free online survey and questionnaire tool, (kwik surveys, 2014) was used. No difference exists in the content of the two questionnaire versions.

The following description shows the structure of the online questionnaire:
Section 1 included seven questions on demographics.

Section 2, named in the questionnaire as Part A, included questions 1 to 6 and sub-parts. Question 1 with sub-parts A-O investigated the respondents' recognition of availability of specific KM projects in the institution under study. Question 2 with sub-parts A to V and two questions included in each sub-part investigated for one the respondents' current KM practices, and as a second point of interest, the importance attributed by the respondents to each of these practices irrespective of its availability. Question 3 with sub-parts A to P was looking at the reasons/incentives behind the use of KM practices by the HEI. Question 4 with sub-parts A to N examined the effectiveness of KM results. Question 5 investigated the familiarity of respondents as to whether the HEI measures KM practices' effectiveness. Finally, question 6 intended to identify the group(s) responsible for the available KM practices.

Section 3, referred in the questionnaire as Part B, included only one question with sub-parts A to AG. This question was looking for the learning practices currently in use in the organization under study.

The questionnaire was designed using material from: 1) the questionnaire for the Knowledge Management Practices Survey, 2001 released by the Science, Innovation and Electronic Information Division of Statistics Canada (Government of Canada, 2001) (Canada Statistics, 2001); and 2) the questionnaire on the Dimensions of the Learning Organization of Watkins and Marsick (Watkins & Marsick, 2003). Other sources were also consulted and additional questions were inserted in order to examine all of the business aspects necessary for a KM implementation.

All of the questions included in the employee questionnaire were closed in type. Such closed questions are of course easier to analyze (Hussey & Hussey, 1997) although many times a lot of them are necessary in order to cover a certain area of investigation. Furthermore, open questions which offer for the elaboration and analysis of the areas investigated were not considered necessary as such input was received via the separate focus groups' meetings and the data collected from the interviews with the administrators. In relation to some questions the respondent was simply directed to select all appropriate items presented in a list e.g. for question 1 participants were asked to select from a list of KM projects all that they recognized as being available. For some other questions the answer involved a "Yes/No/Don't know" selection. Being aware of the central tendency problem of scales, which is associated with the tendency of respondents to rate everything as average as well as other problems relating to scale designs such as the halo effect and leniency (Kendall & Kendall, 2013), I decided to avoid offering a middle choice and thus, adopted a four-point Likert scale, as used in other similar studies e.g. (Harvey, et al., 1992) (Martilla & James, 1977). Also, by using a four-point scale the participants were 'forced' to think more about their answers and thus take a stance on the issues addressed in the questionnaire. The final Likert scales used were the following:

Not at all important	Somewhat important	Important	Critical
Not at all effective	Somewhat effective	Effective	Very effective
Never	Sometimes	Often	Always

The first page of the questionnaire was a "Consent Form for Participation in a Research Study". This page offered an introduction and addressed issues of confidentiality, participation, etc. In particular regarding participation the form stated that the survey remained completed voluntary and that any question could be skipped. Thus, a Don't know/Not available or similar reply was not considered necessary and was not included in the scales. It was also explained to the respondents that their submission of the questionnaire denoted their consent to participate (see Appendix B).

Cognitive Testing

I undertook cognitive testing of the questionnaire through ad-hoc focus group meetings with members of the target population to ensure that the questions were well understood. Feedback from group members was incorporated into the questionnaire design.

Sample Selection

The Universe in the employee survey comprised all full-time employees including faculties, staff, and administrators of the institution under study.

This population was contacted using the email list of the institution.

Questionnaire Administration

All of the communication between me and the employees of the institution prior to the administration of the questionnaire, which involved a first invitation to participate in the survey and a reminder regarding participation, was done via e-mail (see Appendix B). The employees were provided with the link to the online version of the questionnaire while at the same time the questionnaire was forwarded to them as an attachment if they wished to print it and complete it. In the second case, they were asked to drop the completed questionnaire in my business mail box, located at the premises of the institution, so as to ensure anonymity. The consent form which they also had to sign was a separate page which they should not staple with the remainder of the questionnaire. The majority of the respondents selected to complete the online version of the questionnaire. This allowed for the fast collection of electronic data which were immediately ready for analysis. The use of e-mails and electronic means as research tools is supported by (Selwyn & Robson, 1998).

Data Collection

The data collection period expanded from the 19th of September to the 7th of October. At the time of closing down 106 online responses were received out of which 91 questionnaires were considered valid as the remaining 15 involved blank submissions. All data was exported in a spreadsheet (Excel) file. Another 6 questionnaires received in hard copies were added in the spreadsheet. From the final analysis 12 more questionnaires were excluded in which only the demographics section was completed. The final number of questionnaires used for analysis was therefore 85 (Table 8).

Table 7. Employee Survey - Data Collection

	Online	Hard-copy	Total
Submitted	106	6	112
Blank	15	0	15
Invalid	12	0	12
Valid used for analysis	79	6	**85**

Disclosure Control

I was bound by the "Consent Form for Participation in a Research Study" which was released to participants prior to the completion of the questionnaire, in which it was stated that the study's research records would be kept confidential and participants would not be identified in any

written or verbal reports. The records were therefore kept in a secured area and locked in a file cabinet in the research office of the investigator. Only research personnel authorized by the investigator had access to the data. All research records will be kept for a period of six months and subsequently all written records will be destroyed. Records may also be inspected by the Research Ethics Committee of the University of Nicosia. Any statistics published from this survey would be carefully checked to ensure that no information that relates to any identifiable individual is being revealed.

A flat file in which all respondent identifiers had been removed was created for tabulation purposes.

Questionnaire Analysis

Data collected through the questionnaire were quantitative in nature. The objectives of the survey could be satisfied by summarizing, describing, and displaying the data. Statistical analysis of the data using both exploratory and inferential data analysis was considered appropriate.

Exploratory data analysis describes the data collected by summarizing and presenting them using graphs, charts and tables. Statistical techniques such as frequencies, means and dispersion were used in the analysis. Cross tabulations were also used to identify interactions amongst groups.

Inferential analysis was used to enhance the findings of the research. In the context of such analysis, quantitative data collected from a sample is used to draw conclusions about the complete population (Hussey & Hussey, 1997).

Quantitative data analysis was done using the specialized IBM SPSS Statistics, and Microsoft Excel software packages.

Further Analysis

One of the objectives of the study was to compare the organization's performance in relation to specific KM practices with the importance attributed by organization members to the same set of KM practices in order to assess KM readiness and satisfaction and to highlight important areas for improvement. To perform this part of data analysis I considered using the Importance-Performance Analysis (IPA) grid, a brief description of which follows.

Importance-Performance Analysis (IPA) was formulated by Martilla and James (Martilla & James, 1977). It was originally introduced as a way of understanding clients' needs and desires so as to make good management decisions about how to respond to them. The IPA approach recognizes satisfaction as the function of two components: the importance of a product or service to a client and the performance of a business in providing that service or product (Martilla & James, 1977) (Silva & Fernandes, 2010). The model is well documented in the marketing literature (Ennew, et

al., 1993); (Slack, 1994); (Matzler, et al., 2003) where it is commonly used to provide directions for making strategic marketing decisions. IPA has also been widely used in service industries such as travel and tourism (Enright & Newton, 2005), (Fache, 2000), (Go & Zhang, 1997); education (Iacovidou, 2009), (Joseph & Joseph, 1997), (Nale, et al., 2000); hospitals (Hawes & Rao, 1985), (Yavas & Shemwell, 2001); and other sectors (Blose, et al., 2005), (Ennew, et al., 1993). It is considered to be a powerful evaluation tool for practitioners and academics to prescribe the prioritisation of attributes for improvement and it can also provide guidance for strategic development (Slack, 1994).

Over the years several approaches to inferring priorities and measuring importance have emerged in the literature (Bacon, 2003), (Fuchs & Weiermair, 2003). For example SERVPERF and SERVQUAL. However, IPA is often preferred over other instruments because it has the importance attribution to the items (Meng, et al., 2011).

The IPA matrix, a two-dimensional grid, is broken into four sections (see Figure 24):

(1) Concentrate Here (High Importance/Low Performance); attributes that fall into this section represent key areas that need to be improved with top priority.

(2) Keep-up the Good Work (High Importance/High Performance); all attributes that fall into this section are the strength and pillar of the organization.

(3) Low Priority (Low Importance/Low Performance); any of the attributes that fall into this section are not important and pose no threat to the organization.

(4) Possible Overkill (Low Importance/High Performance); attributes that are overly emphasized by the organization. Instead of focusing on this section organizations should allocate more resources to deal with attributes of section 1.

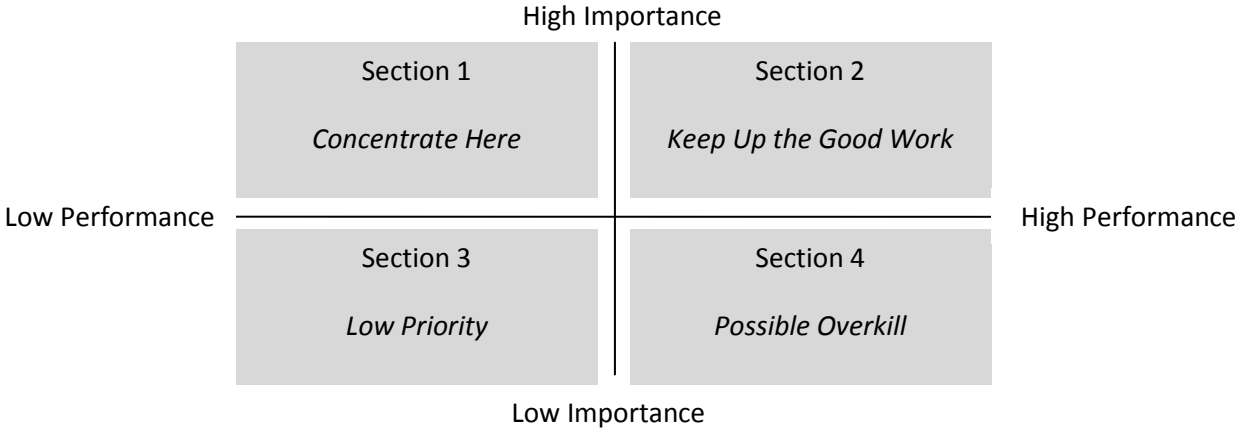


Figure 24. The IPA Framework (Martilla & James, 1977)

Student Questionnaire

A much shorter and simplified questionnaire was generated to collect data from students. This second questionnaire indented to just collect students' experiences of KM projects and practices available within the institution as well as their perceived importance of the same practices.

A brief description of the survey design, population, and administration follows. A brief analysis of the two questionnaires can also be found below.

The student questionnaire is a shorter and simplified version of the employee questionnaire which was described above. This second questionnaire was used to collect students' experiences of KM practices available within the institution as well as their perceived importance of the same practices.

The student questionnaire (see Appendix B) included:

Section 1, with four questions on demographics.

Section 2, included Question 1 with sub-parts A to Q. Each sub-part had two questions which investigated for one the respondents' recognition of availability of specific KM projects in the institution under study, and as a second point of interest, the importance attributed by the respondents to each of these projects irrespective of its availability.

The first page of the questionnaire was again a "Consent Form for Participation in a Research Study". The sample selection for the student survey was a random sample of 61 students. The questionnaire was administered online.

Qualitative survey

The main survey objectives, as stated already, were to identify current KM practices in the HEI, establish stakeholder's perceptions of the "knowledge organization", identify needs and opportunities relating to KM, investigate the "as-is" and formulate the "to-be" KM-friendly and implementation-positive environment. Besides the quantitative data collected from the employees and the students who completed the questionnaires and in order to gain further elaborated understanding of the issues concerned with the study a second qualitative survey was initiated. Research tools which allow for such qualitative data to be collected were utilized. In particular, focus groups with members of the staff and faculty members were created. Additionally, interviews with senior administrators were conducted.

Focus groups with stakeholders

Focus groups were incorporated in the study to investigate the HEI's stakeholders' perceptions of KM, their current practices including strategy, leadership style, and culture, and in general their feelings, opinions, and views about "the HEI being a knowledge and a learning organization".

The following focus groups of stakeholders were formed:

- Focus Group 1: Involved full-time faculty members teaching in three out of the five schools of the HEI, being the School of Business, the School of Humanities, Social Sciences,

and Law and the School of Sciences and Engineering. The School of Education was not represented in the focus group meeting since no faculty from this school had accepted the invitation to participate in the meeting. Also, faculty from the Medical School have not participated in the meeting since this school is running autonomously and independently from the remaining university. Initially an email invitation was sent to all Deans, and Department Heads, who are in fact elected senior faculty members with some release from their teaching duties in order that they perform certain administrative duties. A total of twenty-two faculty members were informed about the undergoing research survey and were invited to participate in the focus group meeting. Only three members have accepted the invitation, being one Dean and two Heads of Departments. The invitation was then extended to more senior faculty from different schools. Finally, the group was formed to include seven participants, all senior faculty with several years of experience at the HEI. A detailed profile of the faculty participants is shown in Table 9.

Table 8. Focus Group 1 – Faculty Members

Male	Female	Years of employment	Total
3	0	6-9	3
3	1	10+	4
			7

- Focus Group 2: Comprised of staff members from different functional units of the HEI selected randomly based on years of employment and gender. In total twenty staff members were contacted via an email invitation through which they were invited to participate in a focus group meeting. Ten different units/offices were represented in this group invitation. Seven staff members from six units/offices of the HEI have accepted the invitation and these formed the second focus group the composition of which is shown in Table 10.

Table 9. Focus Group 2 - Staff Members

Male	Female	Years of employment	Total
1	2	3-5	3
1	3	10+	4
			7

Each focus group had a meeting called by me which took place at a neutral location being a meeting room. Introductions were not necessary as everyone present knew everyone else; therefore, I went straight on to explain the purpose of the study. The consent of all participants for participating in the study was obtained in writing, confidentiality was confirmed, and informality and openness were encouraged since all of the members were acquainted. The importance of their contribution to the study and opportunity to voice their feelings and opinions

were stressed to them, as well as their right to withdraw at any time. It was also stressed that the findings would be made available to the institution's executive managers and suggestions would be made towards the development of a positive KM environment leading to a successful KM implementation.

Each meeting started off with a 10-15 minutes presentation I gave on "What is KM?" and its benefits. Following the presentation the group members were asked to complete a short quiz, made of fifteen short Yes/No questions to determine the current state of KM in the organization. The quiz was taken from the research of (O'Dell, et al., 2004). The results were also interpreted based on the "Road Map to KM" by (O'Dell, et al., 2004). Participants commented on the results and the discussion continued with the following general open-ended question: "*What, in your opinion, constitutes a 'knowledge organization - KO'?*" Following everyone's initial standpoint, an agreeable definition of a KO was formulated. A second definition of a KO and its characteristics, compiled from the KM literature, was presented as following:

"A knowledge organization is an organization which focuses on networking and knowledge creation, sharing, and application. Such an organization is characterized by the following:

- Awareness of the importance of information and knowledge;
- A growing appreciation for the knowledge level of employees;
- A continuous effort to liberate and amplify the knowledge and creativity of all organizational members;
- Promotion of employees' ideas and capabilities to improve decision-making and organizational effectiveness;
- A capability for learning so that the entire firm will learn while it works and be able to adapt quickly to market changes and other environmental perturbations; and
- Recognition of the difficulty of dealing with complexity and with ever increasing competition spurred by technology and the demands of sophisticated customers." (Bennet & Bennet, 2003).

The discussion continued with the following open-ended question: "*Is our HEI a 'knowledge organization?*". The following key areas were put on the board as discussion directives:

- Current leadership and management style
- Organizational structure
- Organizational culture
- Organizational behavioural aspects and social interactions
- The principles and practices needed to ensure that individuals may collaborate and share knowledge
- Recommendations for the creation of a positive environment for KM

- Recommendations for embedding the required technology in the organization workflow so as to create a knowledge organization.

Acting as a moderator of the focus group session I encouraged the group members to discuss the topic in terms of their experiences, knowledge, beliefs, expectations, needs, and attitudes towards KM and the establishment of a knowledge organization. I made no attempt to lead the discussion in any direction to avoid bringing any predetermined ideas or bias in the discussion. I had to intervene as needed to limit the domination of the discussion by certain participants and thus ensure the participation of all members. All focus group sessions were audiotape and later transcribed for further analysis. An approval to audiotape the sessions was obtained from all participants at the beginning of the sessions.

The data collected during these sessions were analyzed using the Miles and Huberman's (Miles & Huberman, 1994) General Analytical Technique (discussed in the section of Qualitative Data Analysis). The data collected from the focus groups along to that collected via the interviews which were conducted with senior administrators, enabled comparisons and cross tabulations. The final conclusions also included the data collected from the questionnaire which was administered to all faculty and staff members and the second questionnaire which was distributed to the students.

Interviews with senior administrators

To benefit from the advantages which personal interviews had to offer, such interviews were organized with top-administrators for a further investigation of their viewpoints in relation to knowledge management and the HEI's practices. These were focused semi-structured interviews for which the area of focus and the more specific areas of interest were pre-decided and a set of questions were formulated. During the actual interview administration I maintained the control of the flow by following the pre-formulated interview structure. The question set included some closed questions which allowed covering ground quickly, as well as some open questions which allowed the interviewee to express and explain his/her viewpoints and talk about something in detail and depth. In the open-ended questions, following Lazarsfeld (Lazarsfeld, 1944) method, a check list with possible answers was used in order to allow for faster codification. The execution of the interview questions was flexible allowing me to change the sequence of the questions or skip some based on the answers received to some other questions (See Appendix B for the question set of the interviews).

The University has an academic and administrative structure. The top administrative body is the Executive Council, chaired by the President and comprised among others of the Executive Vice President for Administration, the Vice President for University Relations and Community Outreach, the Vice President for Enrolment and Development, and the Vice President of Finance.

The highest academic body is the Senate, chaired by the Rector and comprised, among others, of a Senior Vice Rector, a Vice Rector for Academic Affairs, a Vice Rector for Faculty and Research, the Deans of Schools and other elected members. Some administrative departments are run by their Heads, for example the Head of the Facilities Office, the Head of the Office of Quality Assurance and Student Support and the Head of the Computer Centre. The Distance Learning unit is headed by an Executive Dean for Distance Learning and the Library by a Director of Libraries. Departments are headed by Department Heads. School and Department Councils are led by the School Deans and the Department Heads respectively and include the Heads and other elected faculty members.

Excluding the School Deans and the Department Heads who were targeted to participate in the focus group of faculty, the remaining fourteen top administrators were all approached for interviewing and no sample selection was considered necessary.

A personal email (see Appendix B) was sent to the above-mentioned top-level administrators. In the email I explained briefly the purpose of the study and requested an interview with the administrator. The interviews were arranged either by email or telephone. A total of fourteen administrators were originally approached with twelve interviews conducted with available administrators. The interviews were scheduled to be held in the privacy of the offices of the participants in order to make them feel more comfortable and since this arrangement was more convenient to them.

Access to the interviewees did not present a problem since as a practitioner research and a faculty member of the institution I had the opportunity to meet and collaborate with all of the interviewees in the past on various academic matters. All interviews, with the necessary interviewee permission, were audiotaped. Recordings were safely stored and were available only to myself during the study while they would be destroyed with the completion of the research. The major advantage of audiotape-recordings is that is allows the interviewer to concentrate on questioning and listening (Saunders, et al., 2003). It also provided me with the opportunity to create a full record of the interview immediately after its occurrence thus, control bias and produce reliable data for analysis. A possible disadvantage of audiotape-recordings is that these may inhibit responses. The issue of confidentiality and anonymity was of up-most importance especially since the interviews were used for data collection purposes and the population was so small. For that reason, all interviewees were assured of their anonymity and of the fact that the findings of the research would make no reference to specific titles, such as Rector, Vice Rector, etc. Interviewees were asked both for their personal opinions and perceptions on certain topics as well as for their views based on their official position at the institution.

With the use of interviews there is always the danger of bias (Bell, 1999) and that is probably a researcher's greatest challenge when conducting interviews. If the same person however, conducts a set of interviews the bias may be consistent and thus, go unnoticed (Bell, 1999). Borg, (Borg, 1989) mentions as some of the factors which may lead to or allow bias to take place, the eagerness of the respondent to please the interviewer, a vague antagonism between the interviewer and the respondent, or the tendencies of the interviewer to seek out the answers that support his preconceived notions.

I made a conscious effort to approach all of the above mentioned risks and minimize them to the extent possible. My objective throughout the interviews was to remain completely impartial and not to act in any way which would affect the respondents. My views on the matter under study were concealed and I used my experience with research (DPS4520 Review of Learning) to conduct the interviews with professionalism and self-control.

The audiotaped interviews were later on transcribed and analyzed using the Miles and Huberman General Analytical Technique (Miles & Huberman, 1994) (discussed in the section of Qualitative Data Analysis) which has been used successfully for similar purposes in various other studies (McRoy, 2006). The analysis of the data collected from the interviews was very much helped by the fact that as mentioned already all interviews followed a structured to semi-structured approach with a pre-decided set of questions drafted down (see Appendix B).

Document Investigation

To complete the investigation of the current practices of the HEI hard data have been collected from a number of sources. They involved internal documents (official and drafts), presentations, reports, etc. and they were collected from different departments, administrators and others, as well as from the organization's website.

Qualitative Data Analysis

Qualitative data collection results in non-standardized data, which the researcher is required to classify into specific categories. Meaningful analysis is only possible using conceptualization (Saunders, et al., 2003). There is in fact no clear and accepted set of conventions for analysis of quantitative data (Robson, 1993). Hussey and Hussey (Hussey & Hussey, 1997) suggest that two methods can be used for analysing qualitative data: quantifying methods which aim to turning the qualitative to quantitative data, and non-quantifying methods. This second group is preferred when a phenomenological or interpretivist paradigm is adopted, as in this part of the present study.

The General Analytical Procedure, suggested by Miles and Huberman (Miles & Huberman, 1994), is a non-quantifying method that can be used with any research methodology. It presents a

staged approach, which advocates systematically disaggregating and re-aggregating data into themes or categories through coding. Codes represent themes or concepts and coding systems are developed either prior to, or during, data collection and analysis.

Support for the use of the Miles and Huberman approach is offered by Punch (Punch, 2005) as well as by Saunders and et al. (2003), who say that the approach is systematic and structured with a number of references.

The General Analytical Procedure for qualitative data analysis proposes a framework known as the "Transcendental Realism", which has three concurrently executed activities being: data reduction, data display, and conclusion drawing and verification (Figure 25).

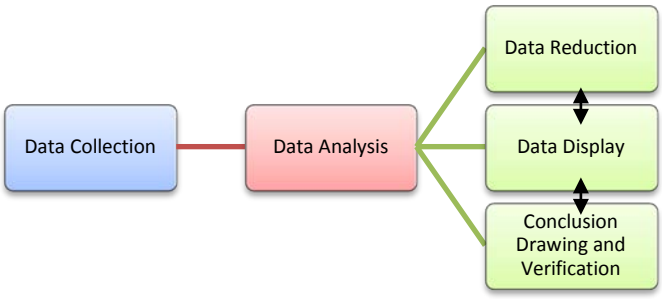


Figure 25. General Analytical Procedure

The procedure utilized in this research study, for the analysis of the qualitative data was consistent with the Miles and Huberman (Miles & Huberman, 1994) General Analytical Technique. The first step of data reduction enabled the simplification and conversion of the collected data into written records, such as transcripts. Then, data displays were created for the purpose of developing condensed and easily available information in the forms of lists and tables so I would gain a better understanding of the issues under investigation and improve my ability to reach conclusions. Lastly, conclusions were drawn and verified to ensure the validity of the measurement tool (Figure 26).

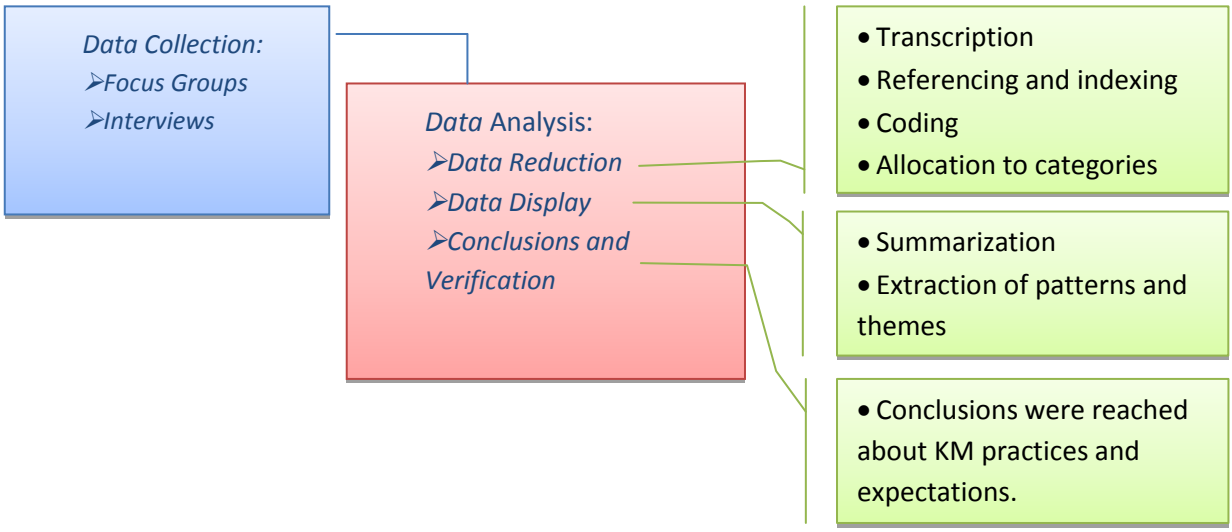


Figure 26. Qualitative Data Analysis using the General Analytical Procedure by Miles and Huberman

4.5. Conclusion

The purpose of this chapter was to describe and justify the philosophy as well as the various research methodologies, techniques and procedures adopted and implemented in this research study. Various sections of this chapter addressed issues such as the conceptual issues behind this study, the research design used, the population set, the specific instruments used for data collection and data analysis and the rationale for their selection. The problem based enquiry approach which was adopted as well as the research methodology and tools which were utilized in the study satisfied this research's objectives and allowed the achievement of the aims of the study.

The next chapter presents a comprehensive analysis and discussion of the findings of all of the above research activities.

[5]

Research Findings, Analysis and Discussion

This chapter presents the data analysis of the quantitative and the qualitative data collected from the different survey activities.

"To Know what you know and what you do not know, that is true knowledge." -- Confucius

CHAPTER 5: RESEARCH FINDINGS, ANALYSIS AND DISCUSSION

5.1. Introduction

This chapter presents the research findings derived from both the qualitative and the quantitative survey activities as these were explained in the previous chapter. Each survey component is analyzed separately starting with the quantitative data analysis which included the employee survey and a student survey. In a different section on the qualitative data analysis, there is the presentation of findings from interviews held with the top administrators and the processing of findings from the meetings with the focus groups of faculty and staff. Finally, general conclusions are drawn and discussed in relation to the overall research objectives.

5.2. Research Aims and Objectives Revisited

Before considering the analysis of the data collected which will lead us to specific conclusions made from the research findings, it might be necessary at this point to be reminded of the research aims and objectives to then see how these have been satisfied with the research activities which were conducted.

The research aimed:

- To deliver a holistic solution for a Knowledge Management implementation in a Higher Education Institution.

A holistic solution for a KM implementation has already been defined (section 3.6.) as one that will engage all aspects of the business hand in hand with the different knowledge dimensions. Thus, in the study which involved establishing the current HEI KM practices as well as the opportunities, expectations, and potential of the institution to become a knowledge organization, the overall purpose was to consider KM spherically and that required the investigation of all critical success factors established to be, the organizational structure, strategy and leadership, technological infrastructure, culture, organizational processes, and measurement. The research objectives which were set materialized with activities which were planned and executed. These included focus groups, individual in-depth interviews, questionnaires, and document evaluation. Through these activities it was possible to collect both quantitative and qualitative data regarding the HEI's status and practices in relation to the above mentioned critical success factors.

Research Objectives

The following research objectives were designed in accordance with the established critical success factors for a KM implementation.

- The current Knowledge Management practices in the Higher Education Institution under study in order to establish whether KM was being used as a management tool on an organizational level within the HEI, to enhance competitive advantage;
- The perceptions of the HEI's stakeholders of the "Knowledge Organization" along with their needs and perceived opportunities relating to KM;
- Whether factors necessary for the successful implementation of KM in the HEI or factors hindering its effective use were present and make the necessary recommendations to the HEI's management regarding corrective actions;
- The introduction of a KM implementation in the HEI using a stakeholder approach. A stepwise development process was to be followed and details on its implementation would be included in a case study which would be possible to use for future KM implementations either by the existing HEI or other similar institutions wishing to use KM.

The procedure followed involved the following steps (see Figure 23):

1. Investigate the HEI's KM practices to establish the "as is" situation. Establish problems, opportunities, and directives for KM implementation.

2. Establish and analyze stakeholders' requirements and other vital proposed changes and formulate the "to-be" situation.

3. Propose changes in targeted areas in order to align the "as-is" with the "to-be" situation.

4. Establish KM criteria for success using soft and hard measures and apply them to assess changes and implementation.

5. Reflect on findings and propose a plan for an organization-wide diffusion of KM practices.

6. Describe the experience of KM implementation in a case study.

Phase I of the research concentrated on the first three research objectives and involved the first five activities of the cycle as these are explained above. The analysis and discussion of research findings which follows in Chapter 5 together with the reflection on these findings performed in Chapter 6 led to an action plan which includes specific recommendations for short, medium, and long-term actions required for the implementation of KM on an organizational level at the HEI.

Phase II concerned the last objective and this was covered by activity 6 of the cycle which involved the introduction of a specific KM implementation in the HEI. This is taken separately in Chapter 7.

5.3. Quantitative Data Analysis

5.3.1. Employee Survey

This survey was conducted to measure:

- *the extent to which knowledge management (KM) practices are used by the HEI under study.*

The investigation of basic learning practices was also considered necessary and was included in the survey as it is necessary for an organization opting for KM to possess learning capabilities. Therefore a second part of the survey intended to measure:

- *the learning practices currently in use at the HEI.*

More specifically the questionnaire enabled me to:

- formulate an overall description and develop the dimensions of a "knowledge organization", as identified by the stakeholders;
- establish current practices and performance ratings in relation to key KM practices (the "as-is" situation);
- identify the expectations, and importance assigned to each knowledge-necessary dimension by stakeholders (the "to-be" situation);
- compare the importance of KM practices with performance to assess KM readiness and satisfaction;
- compare the importance of KM practices with the incentives behind their use as well as the HEI's performance against them in order to identify and prioritize areas for short- and medium-term action by the institution; and
- identify the learning practices currently in use and the importance assigned to them by stakeholders.

Description

The primary objectives of this survey were to determine the business practices used to support the sharing, transfer, acquisition and retention of knowledge by the HEI and whether the organization finds these practices effective.

The survey also aimed at determining the current status of the HEI in relation to it being described as a learning organization (LO).

The questionnaire addressed all of the critical success areas for a KM implementation as these were included in the definition of a holistic KM solution.

Target Population

The universe in the employee survey comprised of all employees of the HEI being faculties, staff, and administrators and involved both full-time and part-time employees.

This population was contacted using the email list provided by the institution.

Data Collection

Data were collected directly from survey respondents. Most respondents completed an online questionnaire. A small minority preferred to complete the hard copy version of the questionnaire which they submitted to my business mail box.

Responding to this survey was optional. All items in the questionnaire were also optional.

Error detection

Edits established to verify the consistency of the data once it was received were applied. Of the 112 submitted questionnaires, 15 were blank submissions and in another 12 only the demographics section was completed. Thus, the final number of valid questionnaires used for analysis was 85.

Response rate

I have requested from the HEI's authorised personnel, in particular the Human Resources Officer, data regarding the institution's work force at the time that the survey was taken. An overall total number of full-time employees of 357 was reported. The participants to the survey were 85 out of whom 75 were full-time and 8 were part-time employees (2 employees did not respond to the specific question). Using 75 as the confirmed number of full-time employee respondents the response rate of full-time employees was 21.0%. It should be noted that according to the employee records of the HR Officer, 146 of the 357 employees (40.9% of the population), are classified as "Administrative"; the remaining 211 (59.1% of the population) are shown as faculties of the four schools. The fifth school, being the Medical School, was not included in the data provided and it was also excluded from the survey analysis since only one employee from this school had completed the questionnaire. It is possible that the "Administrative" group includes a few administrators who are at the same time teaching faculties of different schools. In the survey 83.5% of the respondents selected one of the four schools. The remaining 16.5% may include non-teaching administrators and/or any participant who did not select a school. Analytically, response rates are calculated in Table 11.

Table 10. Employee Statistics and Response Rates

Demographic Variable	Values	Population*	Responded	Response Rate (%)
Gender	Male	159	44	27.7
	Female	198	40	20.2
Age	20-29	41	5	12.2
	30-39	125	24	19.2
	40-49	117	33	28.2
	50-59	50	16	32.0
	60+	24	6	25.0
Years of work experience	0-2	n/a	5	n/a
	3-5	n/a	1	n/a
	6-9	n/a	12	n/a
	10+	n/a	66	n/a
Years of management experience	0-2	n/a	25	n/a
	3-5	n/a	9	n/a
	6-9	n/a	18	n/a
	10+	n/a	24	n/a
Years with current organization	0-2	72	10	13.9
	3-5	79	9	11.4
	6-9	84	19	22.6
	10+	122	45	36.9
Employment Terms	Full-time	357	75	21.0
	Part-time	n/a	8	n/a
School	Business	25	16	64.0
	Education	28	7	25.0
	Humanities, Social Sciences and Law	98	20	20.4
	Sciences and Engineering	60	28	46.7
	Medical	n/a	1	n/a

* According to employee records of the HR Officer

Response rates calculated relative to the population numbers recorded in the records of the HR officer (Table 11) show rates ranging from 11.4 to 64.0%. With 21.0% of all full-time employees responding to the survey safe conclusions could be drawn and generalized for the whole population. Analysis of results by school was also possible since all schools were well represented in the survey; school response rates range from 20.4 to 64.0%.

Data analysis

Demographics

Based on the number of respondents from each demographic group (variable) and subgroups (values) the following statistics were calculated to show the representation of each group in the survey (Table 12).

Table 11. Employee Respondents' Demographics

Demographic Variable	Values	Responded	Participation in survey (%)
Gender	Male	44	52.4
	Female	40	47.6
Age	20-29	5	6.0
	30-39	24	28.6
	40-49	33	39.3
	50-59	16	19.0
	60+	6	7.1
Years of work experience	0-2	5	6.0
	3-5	1	1.2
	6-9	12	14.3
	10+	66	78.6
Years of management experience	0-2	25	32.9
	3-5	9	11.8
	6-9	18	23.7
	10+	24	31.6
Years with current organization	0-2	10	12.0
	3-5	9	10.8
	6-9	19	22.9
	10+	45	54.2
Employment Terms	Full-time	75	90.4
	Part-time	8	9.6
School	Business	16	22.2
	Education	7	9.7
	Humanities, Social Sciences and Law	20	27.8
	Sciences and Engineering	28	38.9
	Medical	1	1.4

Male and female participants' groups were almost equal in size with a few more male than female participants. Full-time employees accounted for 90.4% of the participants. The biggest groups of respondents in the other demographic groups were formed according to:

- age, by participants in the age group of 40-49 years;
- years of work experience, by people with 10+ years of experience;
- years of management experience, by those with 0-2 years of experience;
- years with current organization, by participants with 10+ years of service;
- school, by participants of the School of Sciences and Engineering.

PART A: Knowledge Management Practices

KM Practices in Use

At the beginning the survey participants were asked to recognize which KM practices were currently in use at the HEI. The list included a total of 22 KM practices.

Tables 22-27 were prepared to present the participants' recognition of KM practices in use at the HEI. Additional tables with cross tabulations were also prepared to investigate KM recognition in relation to different demographic groups (Tables 33-46). All of the prepared tables are presented in Appendix C.

In summary of the calculated statistics the following report was prepared. To review the detailed statistics one may refer to the individual tables (Appendix C).

Putting knowledge management into practice

At first, Table 13 was prepared to present a summarized view of recognized KM practices' in use at the HEI according to the different demographics groups along with the size of each group.

Table 12. Demographic Groups and KM Practices in Use

Demographic Variable	Values	Participated in this question (%)	KM practices in use (%)
Gender	Male	56.0	29.7
	Female	44.0	31.8
Age	20-29	3.0	31.8
	30-39	25.3	28.0
	40-49	42.7	28.0
	50-59	21.3	31.7
	60+	7.7	50.2
Years of work experience	0-2	3.2	22.7
	3-5	1.5	9.1
	6-9	14.5	25.3
	10+	80.8	32.3
Years of management experience	0-2	32.7	24.1
	3-5	11.4	20.7
	6-9	21.0	31.3
	10+	35.0	43.7
Years with current organization	0-2	10.7	29.6
	3-5	12.1	38.8
	6-9	22.3	23.8
	10+	55.0	31.5
Employment Terms	Full-time	89.3	29.4
	Part-time	10.7	39.2
School	Business	25.6	32.9
	Education	8.5	36.1
	Humanities, Social Sciences and Law	27.5	32.7
	Sciences and Engineering	38.4	26.3

Highlighted in Table 13 are the recognized KM practices according to the biggest groups of respondents in this question in each demographic variable. Reading the highlighted numbers we conclude that male employees recognized the use of 29.7% of the investigated KM practices; those between 40-49 years of age recognized the use of 28.0% of KM practices; the group with 10 or more years of work experience recognized 32.3, or 7.1 of the 22 KM practices; employees with

10 or more years of management experience recognized 43.7% of KM practices; those at the HEI for 10 or more years identified 31.5% of KM practices being in use; full-timers 29.4%, and finally faculties of the School of Sciences and Engineering identified 26.3% of KM practices listed in the survey as being in use at the HEI.

From Table 13 one may also attempt to create the profile of the employee in the HEI under study with the highest recognition of KM practices in use in the HEI (not necessarily an existing person). This would be a female employee in the age group of 60+ who has at least 10 years of work experience, and over 10 years of management experience, who has been with the HEI for 3-5 years, is a part-timer, and is affiliated to the School of Education.

On average, participants recognized 6.6 (30.2%) of the 22 listed KM practices as being used (Figure 30). School perceptions differ with the School of Education identifying the highest number of KM practices in use being 7.9 (36.1%). Following, is the School of Business with 7.2 practices (32.9%), the School of Humanities, Social Sciences and Law also with 7.2 practices (32.7%), and finally the School of Sciences and Engineering with 5.8 (26.3%) of the 22 knowledge management practices listed recognised by school participants as being used (Table 13). It should be noted that some respondents did not complete the question regarding their school. Amongst them are of course members of the staff who are not allocated to any specific school.

The most important KM practices, selected between those described as critical, were the existence in the HEI of policies or programs intended to improve employee retention (45.7%) and the use, by the HEI of partnerships or strategic alliances to acquire knowledge (35.7%) (see Appendix C, Table 23).

Being asked to recognize specific knowledge management projects available at the HEI, the majority of respondents recognized the following: an intranet for faculty (95.3%); an intranet for students (94.1%); and a wireless network around the university (74.1%) (see Appendix C, Table 24).

In the following figures KM practices were coded as shown in the following table (Table 14).

Table 13. KM Practices with Code Names

KM Practices – Code Names	Code
Policies and Strategies The HEI:	
has a written KM policy or strategy	A
has a value system or culture intended to promote knowledge sharing	B
has policies or programs intended to improve employee retention	C
uses partnerships or strategic alliances to acquire knowledge	D
Leadership In the HEI KM practices are:	
a responsibility of managers and executives	E
a responsibility of non-management employees	F
a responsibility of the knowledge officer or KM unit	G
explicit criteria for assessing employee performance	H
Incentives The HEI specifically rewards knowledge sharing with:	
monetary incentives	I
non-monetary incentives	J
Knowledge capture and acquisition The HEI regularly:	
captures and uses knowledge obtained from other research institutes including universities and government agencies	K
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	L
encourages employees to participate in project teams with external experts	M
Training and Mentoring The HEI:	
provides formal training related to KM practices	N
provides informal training related to KM practices	O
uses formal mentoring practices, including apprenticeships	P
encourages experienced employees to transfer their knowledge to new or less experienced employees	Q
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	R
offers training to employees in order to keep skills current	S
Communications In the HEI employees share knowledge / information by:	
regularly updating databases of good work practices, lessons learned or listings of experts	T
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	U
facilitating collaborative work by project teams that are physically separated ("virtual teams")	V

Average number of practices in use

Figure 27 presents participants' recognition of the investigated KM practices as being used or not in the HEI under study.

With an average of only 30.2% (6.6 of 22) of the presented KM practices recognized as being used at the HEI under study, there seems to be big room for improvement. A 34.9% or 7.7 of the 22

listed KM practices were identified as not being used and another 7.7 practices were identified as neither being used nor being not used ("Don't know"). The three averages being very close one to the other could not lead to any clear conclusion at this point.

Between the individual practices examined some were clearly recognized to be in use such as "The HEI uses partnerships or strategic alliances to acquire knowledge" (code D), "The HEI encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses" (code R), and also the coded practices K, M, and S. For these 5 practices the participants' averages for "In Use" were clearly above those for "Not in Use" and "Don't know".

Similarly, 4 practices were clearly recognized as "Not in Use". These included "The HEI specifically rewards knowledge sharing with monetary incentives" (code I) and also the coded practices J, N, and T. Finally, the majority of the participants selected "Don't Know" as a clear choice for "The HEI has a written KM policy or strategy" (code A).

Figure 27 which shows the average number of practices in use follows.

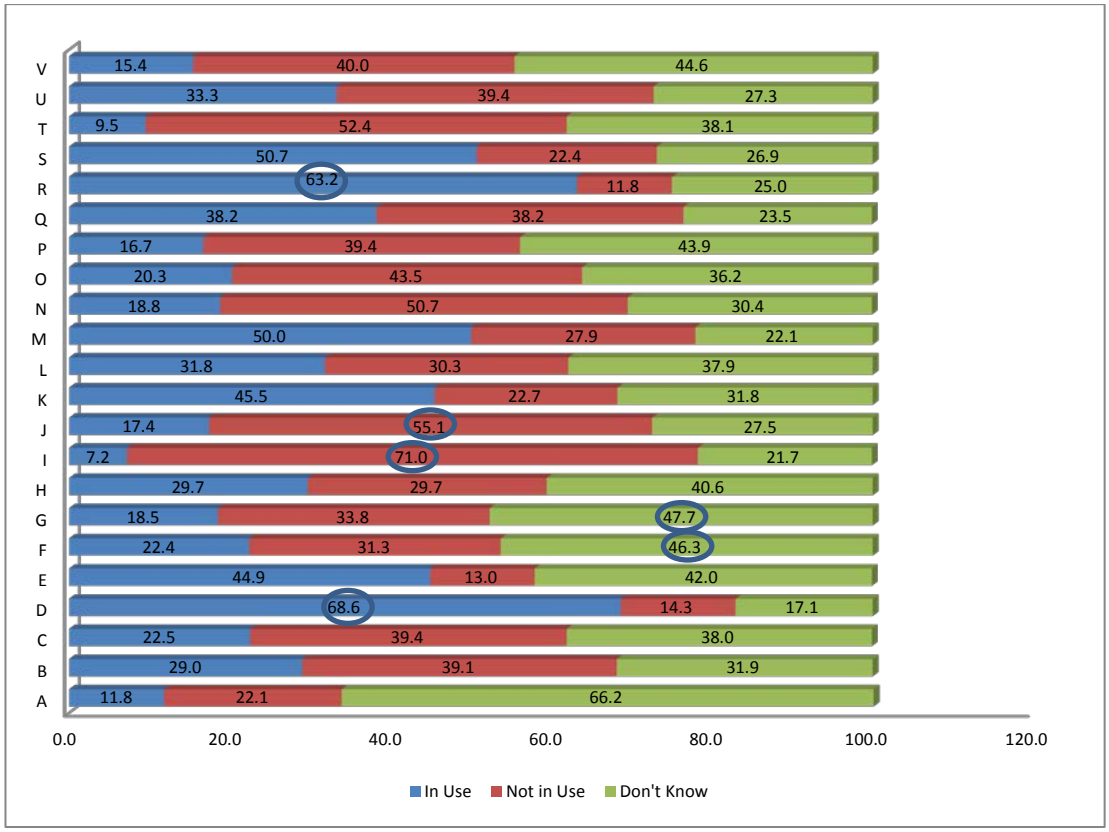


Figure 27. KM Practices and Recognized Use

The activity of knowledge management presented as 22 practices could be grouped under six headings: Policies and Strategies; Leadership; Incentives; Knowledge Capture and Acquisition; Training and Mentoring; and Communications.

Figure 28 shows the average use of KM practices in each of the six categories. "Yes" denoted recognition of the practice as being in use in the HEI; "No" denoted no recognition; and "Don't know" showed the participant's uncertainty for either a Yes or a No case.

A first conclusion reached from Figure 28 considering the reported use ("Yes") for each of the above categories, concerned the fact that all of the categories scored below 50.0% of use, with the highest being the category of knowledge capture and acquisition with a 42.4% usage and the lowest in use the category of incentives with a 12.3% usage.

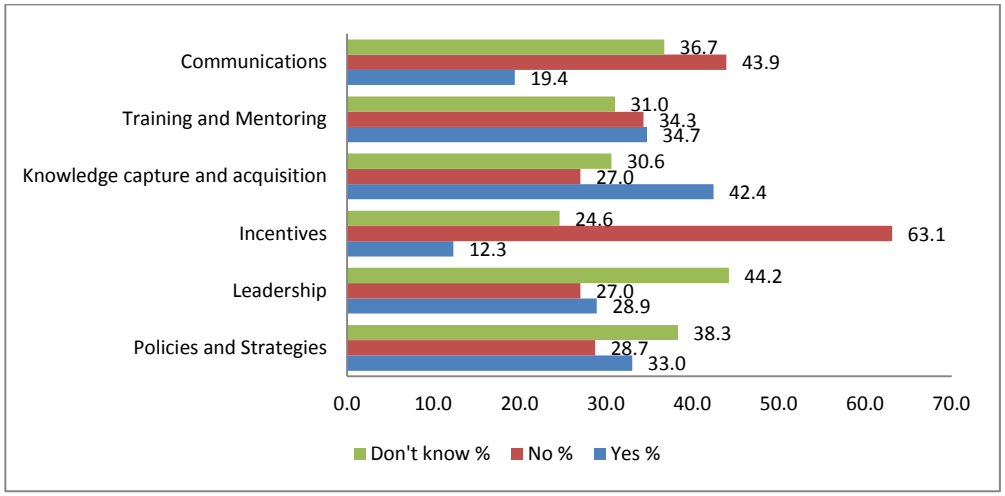


Figure 28. Groups of KM Practices and Usage Recognition (%)

The Yes %, for acknowledging usage of the KM practice, and the No % for the no usage of the same practice were for some categories very close one to the other as is the case of the "Training and Mentoring" group of practices where the difference between Yes and No was only a 0.4%. In such cases, the small difference of the two groups along with the high percentage of those who replied by "Don't know" (31.0%) may be perceived as an area that requires management attention not just in terms of the individual practice evaluated but also in terms of making the institutions' services more transparent to its employees. Of course, the percentage of those who replied as "Don't know" was higher than 31.0% in some other areas as was the area of leadership (44.2%), and in relation to some individual practices it reached the high 66.2% ("The HEI has a written KM policy or strategy"; Figure 27). Such high "Don't Know" percentages regarding the availability or not of specific KM practices at least suggested that the institution had not done a very good job in informing the employees about certain practices, if of course such services were available. And if available, the institution had not of course enforced/used these practices to the extent that its employees would recognize them.

The most frequently used knowledge management practices

Figure 29 which follows reflects the current picture in the HEI in terms of individual KM practices recognized as being used.

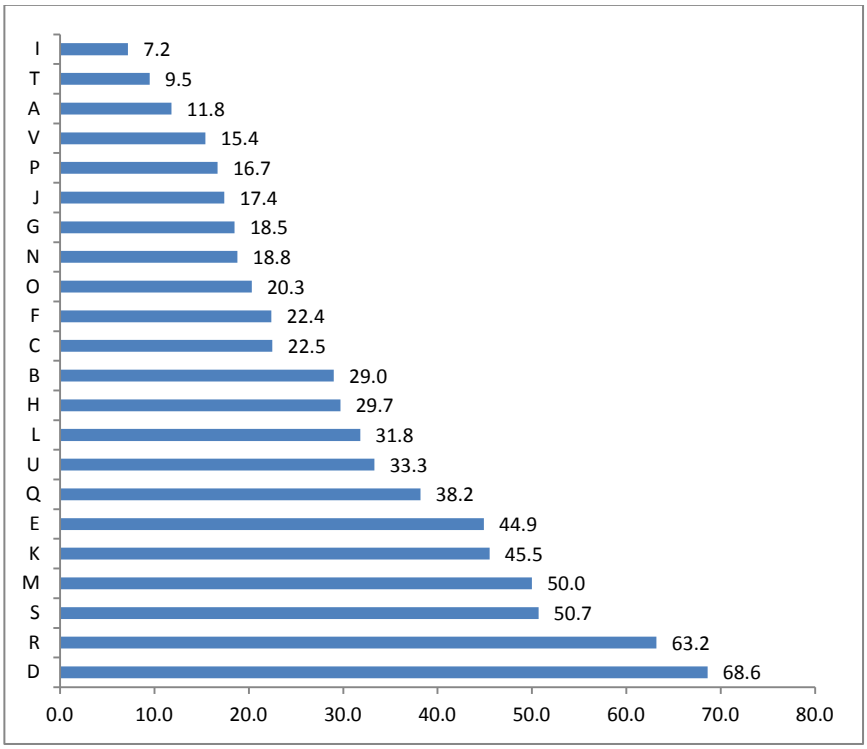


Figure 29. KM Practices in Use Within the HEI (%)

Between the KM practices investigated the ones with highest recognized use were "The HEI uses partnerships or strategic alliances to acquire knowledge" (code D, 68.6%), and "The HEI encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses" (code R, 63.2%). On the other hand the ones reported highest as not being recognized to be used had to do with the monetary (code I, 71.0%) and the non-monetary (code J, 55.1%) incentives offered by the HEI to reward knowledge sharing (Figure 27).

Figures 30-33 show the recognition by school participants of KM practices' usage. The highest reported KM practice for each school actually coincided between three schools. Specifically, for the use of partnerships or strategic alliances to acquire knowledge (code D): School of Business (87.5%), School of Humanities, Social Sciences and Law (76.5%), and School of Sciences and Engineering (56.5%). The second highest (code R, "The HEI encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses") was also in agreement between the same three schools. The fourth school being the School of Education rated its KM practices differently and reported as the highest, with 80.0%, the rewarding of knowledge sharing with non-monetary incentive (code J) and as second higher, the encouragement offered to employees to participate in project teams with external experts (75.0%) (code M).

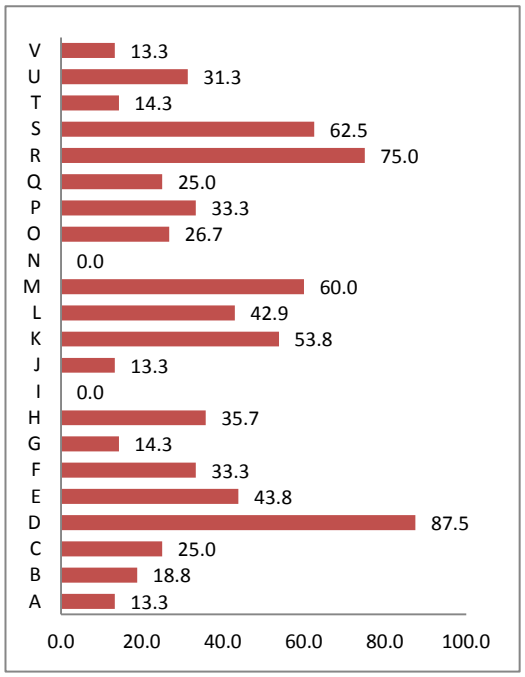


Figure 30. KM Practices (Business School) (%)

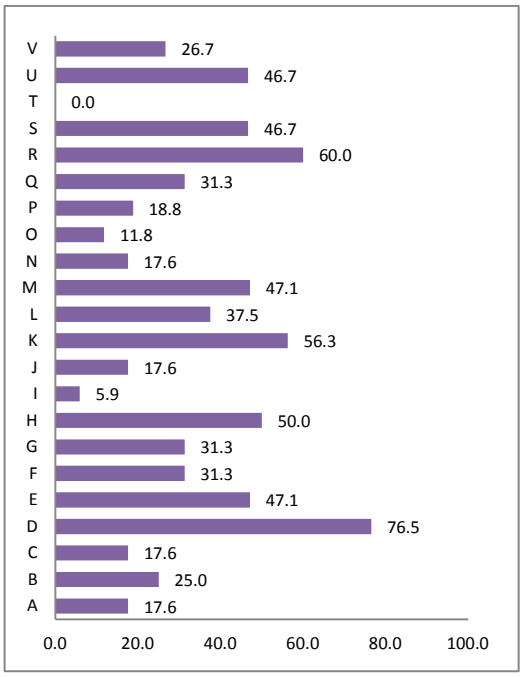


Figure 32. KM Practices (School of Humanities, Social Sciences and Law) (%)

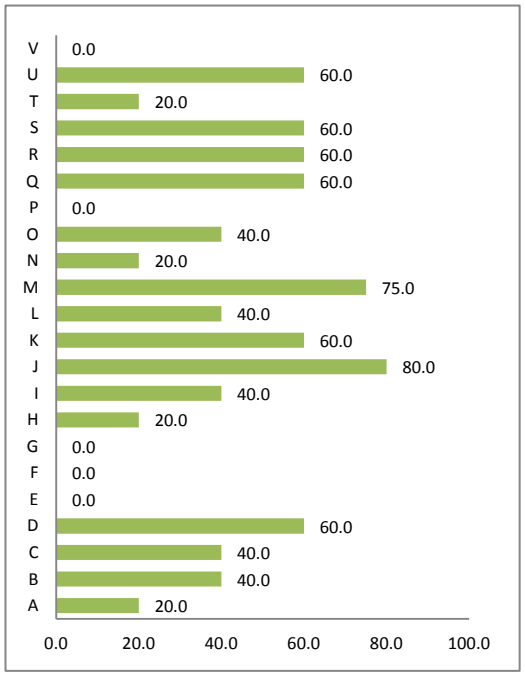


Figure 31. KM Practices (School of Education) (%)

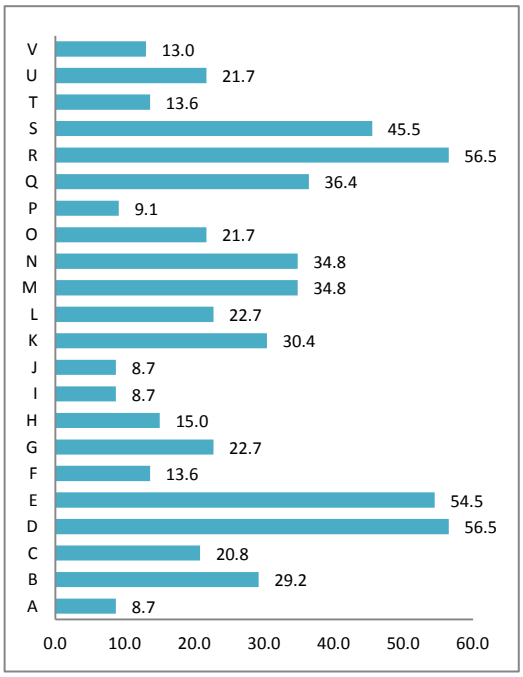


Figure 33. KM Practices (School of Sciences and Engineering) (%)

In agreement with the three of the four schools and the overall population in terms of the first and second recognized as in-use KM practices were also the majority of employees in the group of 10 or more years of overall work experience and the group of 10 or more years of experience in the current organization (biggest groups). Along the same lines was the rating of the full-time employees, the employees in the age group of 40-49, and male employees which were the biggest groups in their respective categories (see Appendix C, Tables 36, 40, 42, 44, 46).

The least frequently used knowledge management practice(s)

As can also be extracted in part from Figures 30-33, there was also agreement between the overall population, all major groups of demographics, and the Schools of Business; Humanities, Social Sciences and Law; and Sciences and Engineering, regarding the least frequently recognized to be used KM practice. This involved the rewarding by the HEI of knowledge sharing with monetary incentives (code I). This also agreed with the highest "No", as not recognized as being used, rating (71.0%) of the overall population (Figure 27).

Importance of KM Practices

Next the participants in the survey were asked to rate the listed KM practices according to importance.

The most critical / important knowledge management practices

Figures 34 and 35 (based on Table 23 in Appendix C) which follow were prepared to summarize the importance attributed by the participants to the investigated KM practices irrespective of whether the same participants recognized these practices as being used or not at the HEI. Also Figure 36 was prepared to show the importance ratings attributed to the KM practices as these were grouped in the six categories being: Policies and Strategies; Leadership; Incentives; Knowledge Capture and Acquisition; Training and Mentoring; and Communications.

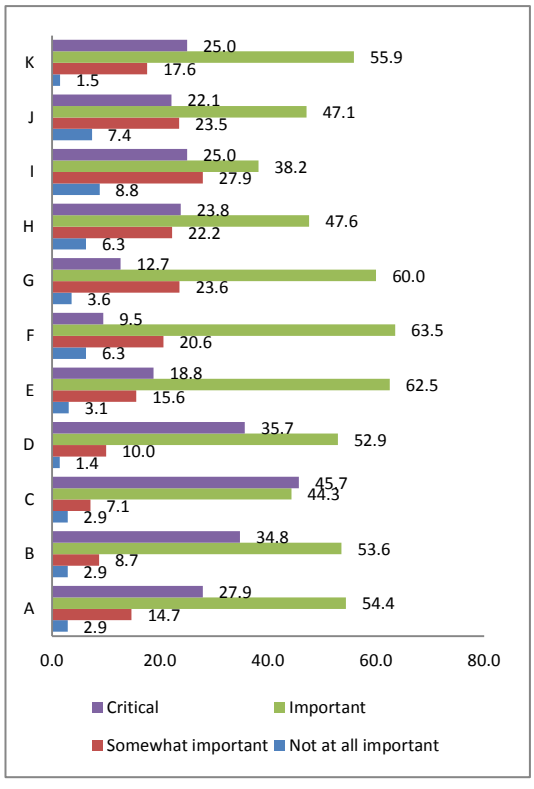


Figure 34. Importance of KM Practices (A-K) (%)

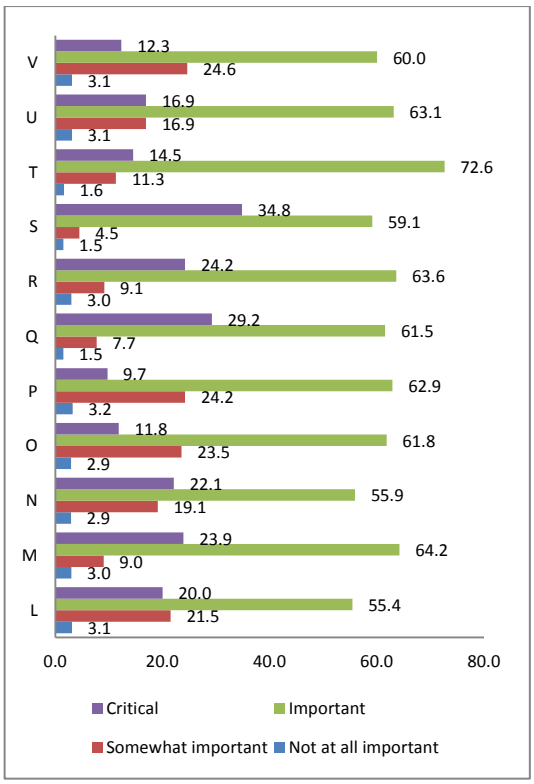


Figure 35. Importance of KM Practices (L-V) (%)

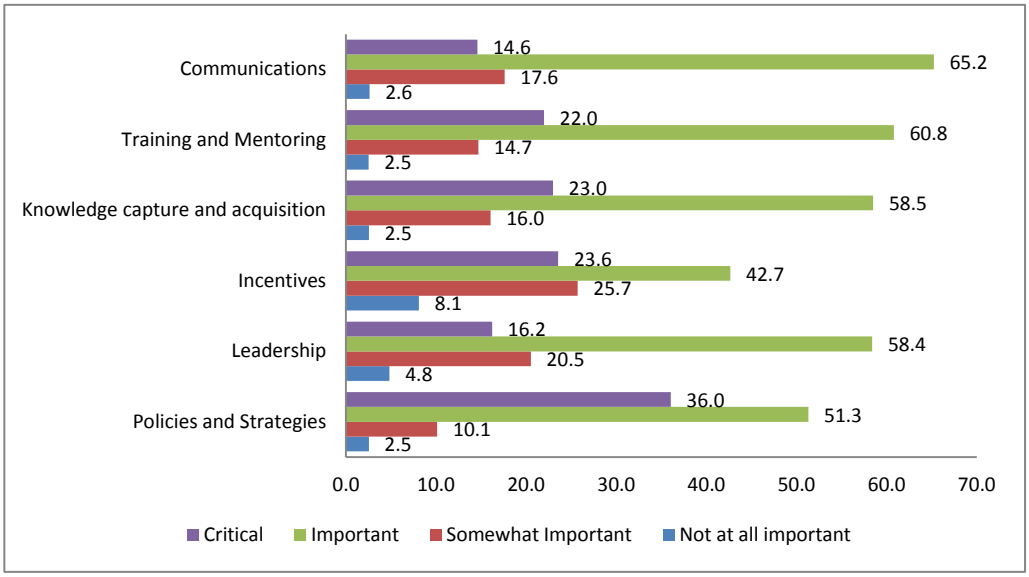


Figure 36. Groups of KM Practices and Importance Ratings (%)

The majority of the participants perceived all of the individual KM practices and consequently all of the groups of KM practices as critical/important.

Employees rated as the most critical KM practices related to the HEI having policies or programs intended to improve employee retention (code C, 45.7%) and the HEI using partnerships or strategic alliances to acquire knowledge (code D, 35.7%). In particular, regarding this second practice it should be noted that the same practice was also rated as the one with highest recognized reported use (68.6%). Thus, one may conclude that the institution was doing very well in regards to this KM direction. Regarding the most critical practice (code C), the recognized reported use was only 22.5% and it ranked 12th out of 22 investigated practices (Figure 28). It should be noted that both of these practices belong to the category of policies and strategies for KM.

The top two items rated as being important were "In the HEI, employees share knowledge/information by regularly updating databases of good work practices, lessons learned or listings of experts" (code T, 72.6%) and "The HEI encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses" (code R, 63.6%). It should again be noted that by the perceived usage the second practice ranked second highest (63.2%) whereas the first practice ranked second last (9.5%) in usage (Figure 29).

Davenport and Prusak (Davenport, et al., 1998) suggested that a critical mass of between 200-300 employees is required before firms identify a need to manage their knowledge strategically. Given that the HEI under study reported 357 full-time employees and some more part-time employees it should be considered very important that the organization takes immediate actions towards the development and implementation of KM practices starting with those seen as most important (critical).

Following are the KM practices seen as critical/important by school participants (Figures 37-40).

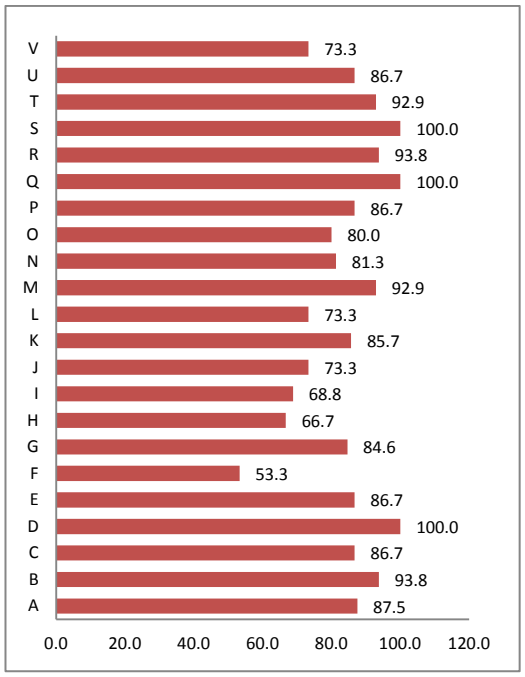


Figure 37. Critical/Important KM Practices (School of Business) (%)

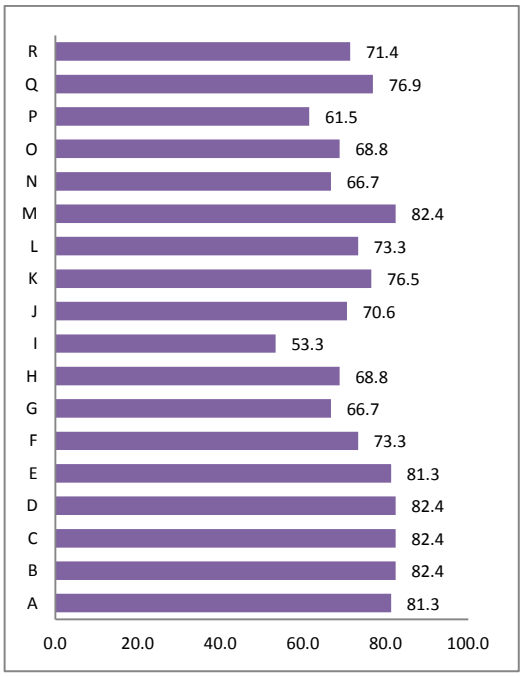


Figure 39. Critical/Important KM Practices (School of Humanities, Social Sciences and Law) (%)

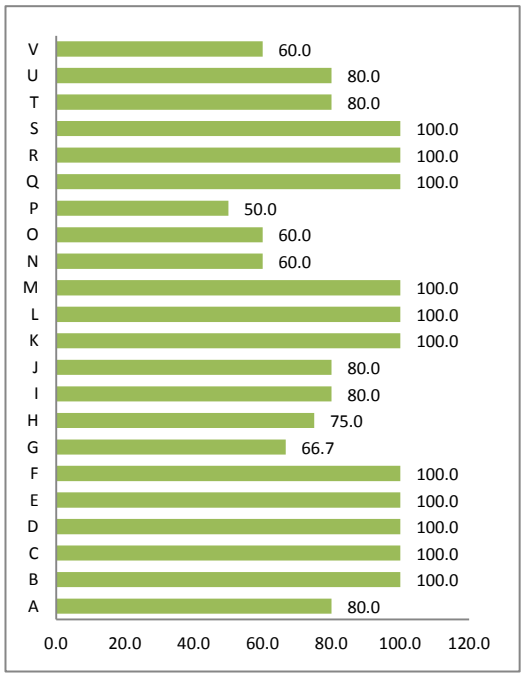


Figure 38. Critical/Important KM Practices (School of Education) (%)

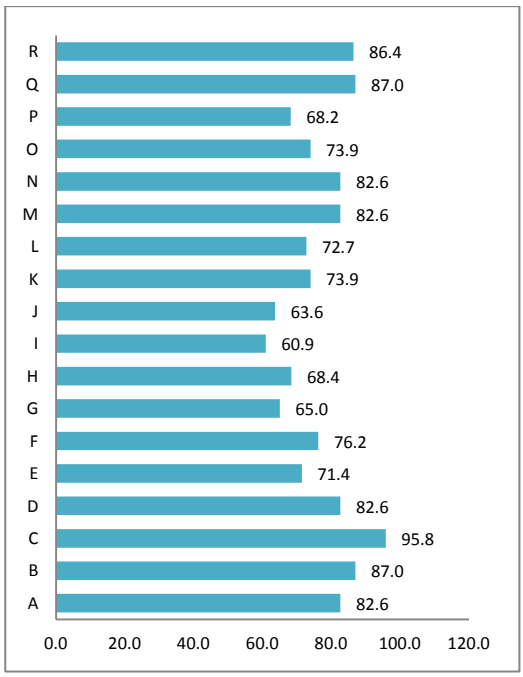


Figure 40. Critical/Important KM Practices (School of Sciences and Engineering) (%)

The four schools did not differ in their evaluation of critical and important KM practices. In fact all 22 practices were rated with 50.0% and above as either critical/important by all schools. The lowest 50% critical/important was given by the School of Education to "The HEI uses formal mentoring practices, including apprenticeships". A 100% critical/important was given to several KM practices by employees in the School of Business and the School of Education. The KM practice "The HEI offers training to employees in order to keep skills current", was rated as 100%

critical/important by two schools being the School of Business and the School of Education, 86.7% (top importance) by the School of Humanities, Social Sciences and Law, and 90.9 (second top importance) by the School of Sciences and Engineering (Figures 37-40).

Table 6 below was prepared to summarize the KM practices with highest importance (top critical/important) by the different demographics groups in the HEI under study along with the size of each group of respondents (%). The least important KM practices (highest between "Not at all important") also appear in the table.

Table 14. Demographic Groups and Importance of KM Practices

Demographic Variable	Values	Participated in this question (%)	Most critical/important KM practices (%)	Least important KM practices (%)
Gender	Male	56.9	C (92.3), S (91.9)	J (10.53)
	Female	43.1	S (96.4), R (96.3)	I (7.14)
Age	20-29	3.3	B,C,S* (100.0)	-
	30-39	24.4	S (93.8), T (93.3)	G (8.3)
	40-49	42.3	S (100.0), B (96.6)	I (10.71)
	50-59	22.0	C (93.3), D (86.7)	A,F (7.14)
	60+	8.1	T (100.0), C (83.3)	J (40.0)
Years of work experience	0-2	3.9	B,C,S* (100.0)	-
	3-5	1.6	B,C,S* (100.0)	-
	6-9	11.8	C,D,S* (100.0)	I,J (10.0)
	10+	82.7	S (92.3), B (90.9)	I (9.26)
Years of management experience	0-2	31.9	S (89.5), Q (88.9)	I (22.2)
	3-5	10.6	B,C,S* (100.0)	I (14.29)
	6-9	21.2	B,C,S (100.0)	H (8.33)
	10+	36.3	C (95.7), B (95.5)	H (5.0)
Years with current organization	0-2	10.7	B,C,S* (100.0)	-
	3-5	12.3	C,D,S* (100.0)	-
	6-9	20.5	D,S* (100.0)	T (7.7)
	10+	56.6	B (89.2), S (88.2)	I (13.51)
Employment Terms	Full-time	89.3	S (94.7), Q (91.1)	I (10.17)
	Part-time	10.7	B,C,D* (100.0)	-
School	Business	26.6	D,Q,S (100.0)	F (13.3)
	Education	7.3	B,C,S* (100.0)	H (25.0)
	Humanities, Social Sciences and Law	26.6	S (86.7), T(83.3)	I (20.0)
	Sciences and Engineering	39.4	C (95.8), S (90.9)	I (13.0)

* Other KM practices were also evaluated at 100.0% importance by this group

An observation which one can make from Table 15 is that the KM practice "The HEI offers training to employees in order to keep skills current" (code S) is ranked either first or second in priority critical/important by most of the biggest groups of participants (see shaded areas in Table 15 above) and overall by the majority of the respondents' groups (Figures 34, 35). The second most frequently ranked amongst the top two critical/important KM practices by the biggest

respondents' groups is "The HEI has a value system or culture intended to promote knowledge sharing" (code B). In terms of use these two KM practices were given "The HEI offers training to employees in order to keep skills current" – 50.7% usage (ranked 3rd of 22), and "The HEI has a value system or culture intended to promote knowledge sharing" – 29.0% usage (ranked 11th of 22).

The least important knowledge management practice

Reported highest by the overall population between the "not at all important" knowledge management practices is "The HEI specifically rewards knowledge sharing with monetary incentives" (code I, 8.8%) (Figures 34, 35). The same practice was also the most frequently ranked as least important KM practice by the majority of demographic groups as well as the majority of the biggest respondents' groups (Table 15).

Incentives for KM Practices' Use

The participants were also asked to attribute importance to a number of listed reasons for using KM practices in the HEI at the present and/or in the future. Figure 41 shows their opinions.

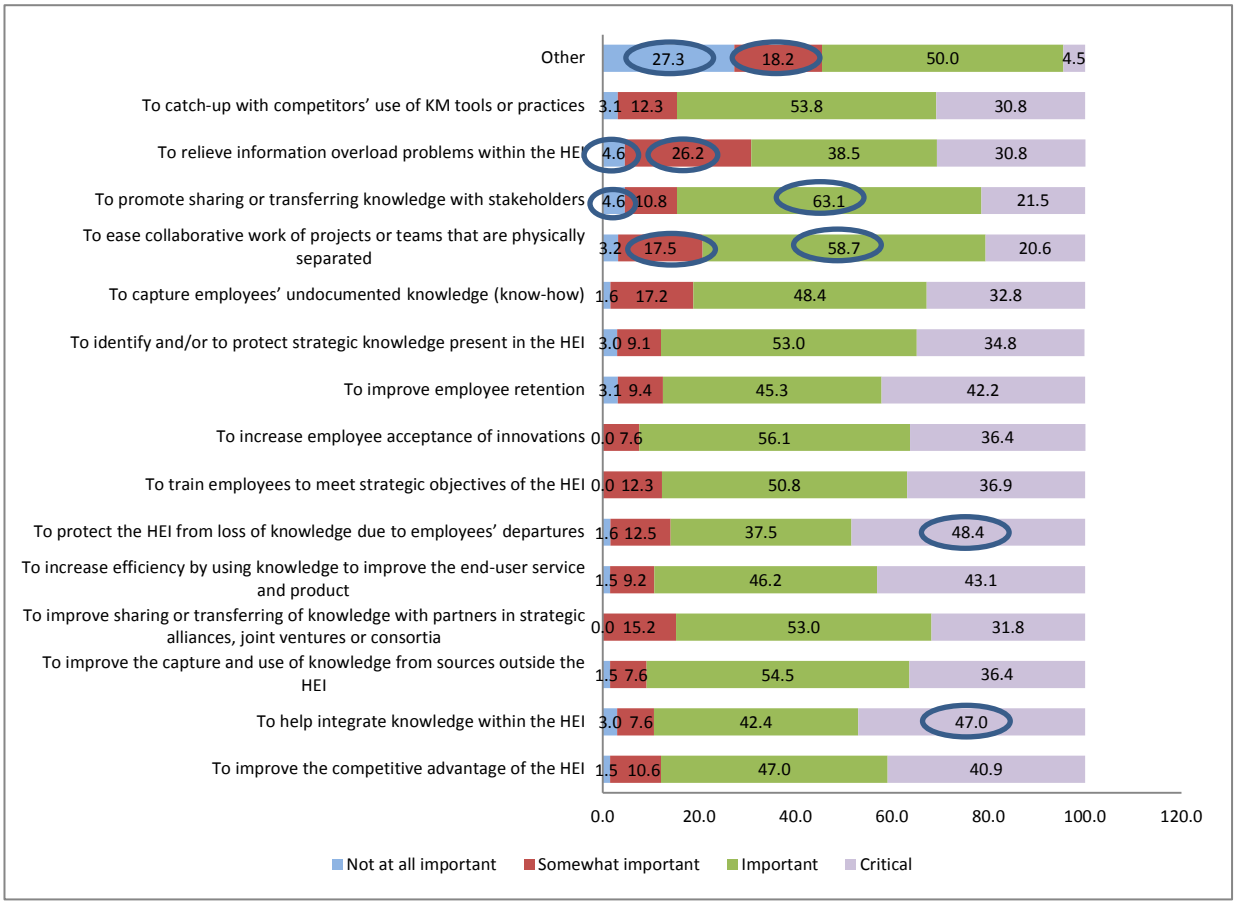


Figure 41. Reasons for KM Practices Usage in the HEI (%)

Reasons that practitioners use their suites of knowledge management practices

According to the majority of the participants the top most critical reason for the use of KM practices was to protect the HEI from loss of knowledge due to employees' departures (48.4%) and then to help integrate knowledge within the HEI (47.0%) (Figure 40). Besides these two top critical reasons some other reasons were also rated very high in importance without being viewed as critical. These were "To promote sharing or transferring knowledge with stakeholders" (63.1%) and "To ease collaborative work of projects or teams that are physically separated" (58.7%). On the other end, some reasons were rated as not at all important. Amongst these the two with the highest "Not at all important" ratings were (excluding "Other" which cannot lead us into any conclusive statements): "To relieve information overload problems within the HEI" (4.6%) and "To promote sharing or transferring knowledge with stakeholders" (4.6%). As for this last item, the fact that it was at the same time the most important reason as well as the most unimportant reason seemed to be a bit contradicting but the great difference in the means (%) was definitely pulling the scale on the side of it being important.

Effectiveness of KM Practices' Use

The participants' opinion regarding the level of effectiveness of particular results as they experienced them from the use of KM practices is shown in Figure 42 which follows.

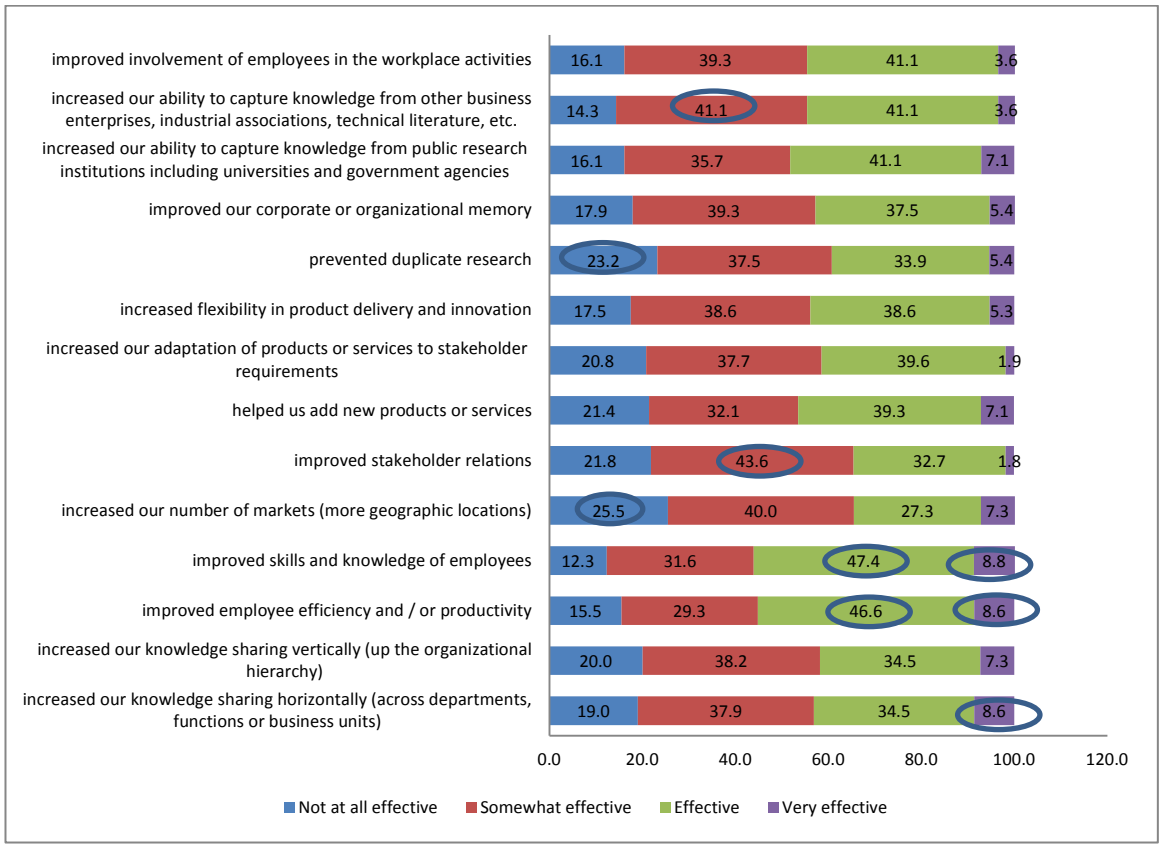


Figure 42. Results of Using KM Practices in the HEI (%)

Results of using knowledge management practices

With the percentages for the scale of very effective, all being very low (below 10%) one may conclude that employees found that the HEI's overall efforts of using KM practices were not very effective (Figure 42). The most effective result of using knowledge management was improving worker skills and knowledge (47.4%). The second place result was improved worker efficiency and/or productivity (46.6%).

Participants were also asked if they were familiar whether the HEI measured the effectiveness of its KM practices. 87.3% replied that they did not know whether the organization measured KM effectiveness and 12.7% that they knew whether the organization measured KM effectiveness which may be perceived as either that they were aware that no measurements were performed or that they were aware that some measurement were performed.

Responsibility for KM Practices

Figure 43 was prepared to summarize participants' knowledge regarding the groups responsible for KM practices in the HEI.

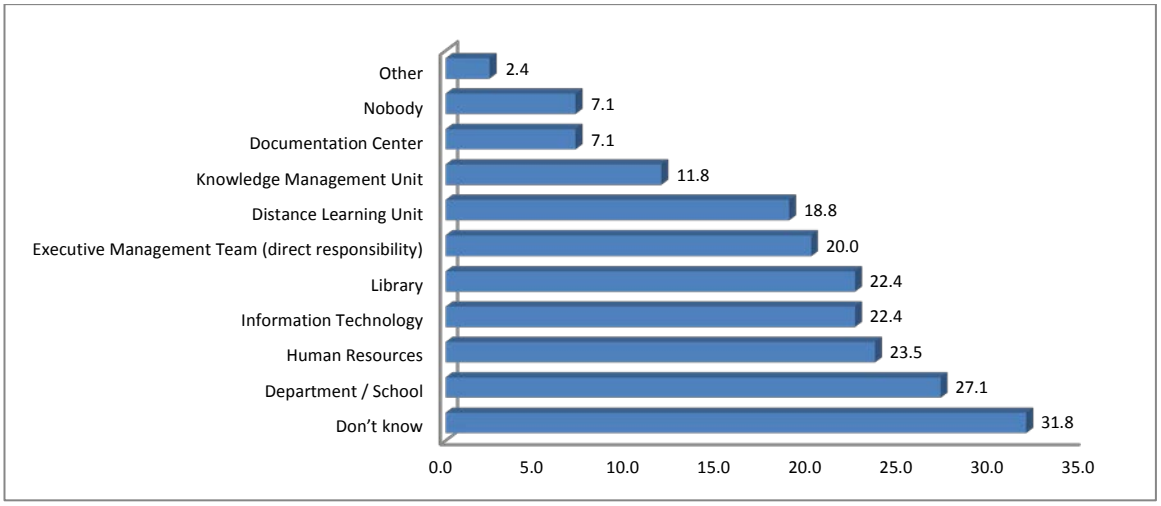


Figure 43. Groups responsible for KM Practices (%) (Sorted)

Who had the responsibility for knowledge management practices?

Most of the participants (31.8%) did not know who had the responsibility of the KM practices within the organization. As the next four or five choices made were all very close, ranging from 20.0 to 27.1 this could be perceived to mean that people believed that the efforts for KM practice were jointly directed by several functional units including the departments and schools, the Human Resources office, the Information Technology unit, the Library, and executive management (Figure 43).

KM Projects Available

Participants were asked to indicate which specific KM projects they could recognize as being available in the HEI. Figure 44 illustrates their answers.

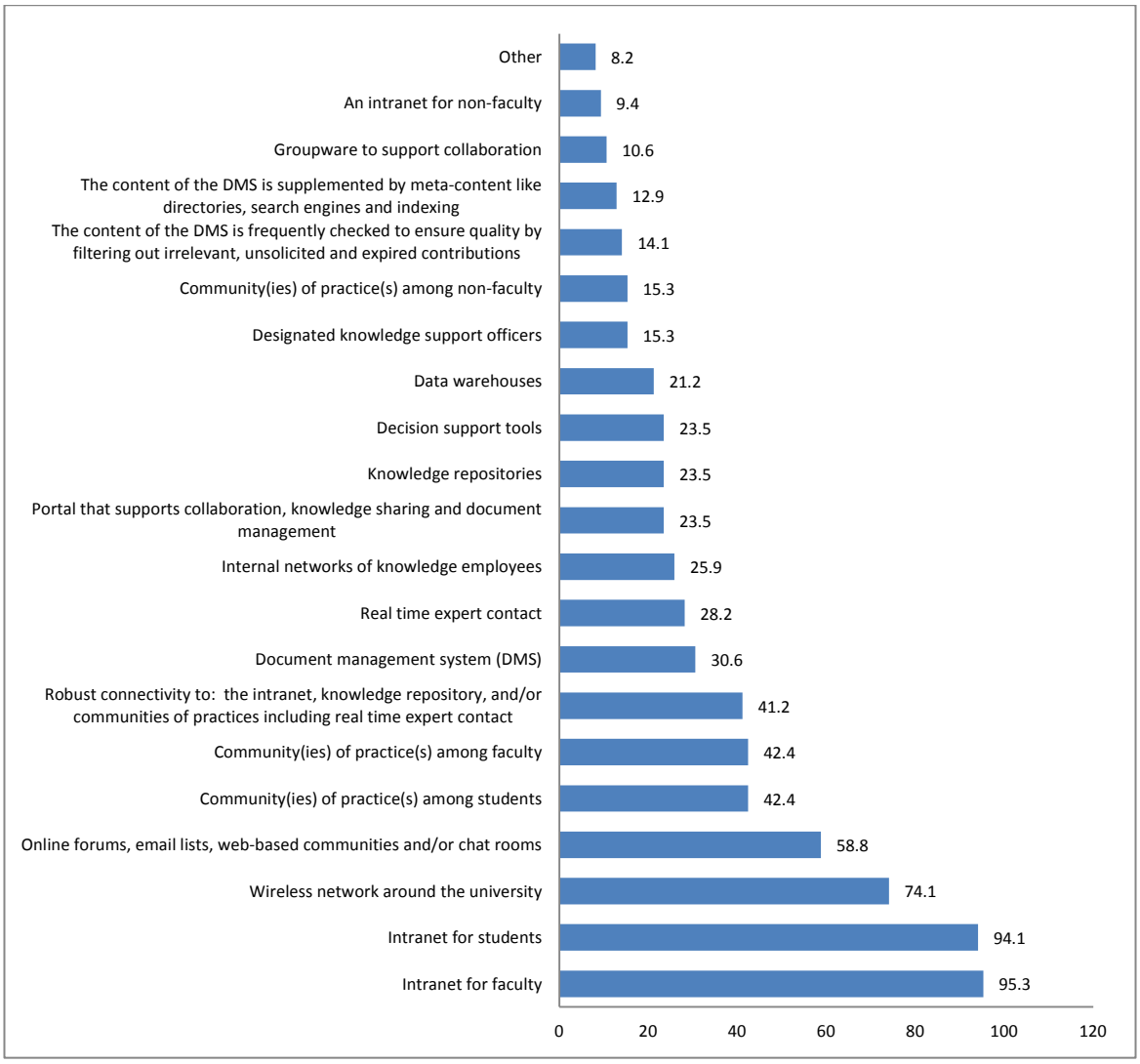


Figure 44. KM Projects Available in the HEI (%) (Sorted)

Knowledge management projects implemented

The majority of the participants recognized the following: an intranet for faculty (95.3%); an intranet for students (94.1%); and a wireless network around the university (74.1%) as being available in the HEI. Following these were "Online forums, email lists, web-based communities and/or chat rooms to encourage the creation of virtual communities of practice" (58.8%) and then the rest of the projects with ratings below 50% with the last one getting a 9.4%. Even though the question was investigating the availability of these projects within the HEI there is a possibility that participants have responded in terms of their personal practices or other group practices in which they experienced the specific technologies/projects.

Some participants have commented in particular about this question, that some terms used here were not clear to them. The argument offered to justify the use of specialized terms, by some

viewed as computer jargon, in this question, was that these terms referred to specific types of information systems which would most probably be known to participants had they been using them. I included examples to aid the participants but since the cognitive testing of the questionnaire had not revealed a problem with the question, no further rephrasing or other changes were considered necessary. With the exception of one item being, "An intranet for non-faculty", which though not available in the HEI got a 9.4% positive reply (as a possible outcome of the above mentioned confusion of used terms), all other items/projects could be used by the participants either at the individual or group or institutional level.

Importance-Performance Analysis (IPA) of KM Practices

One of the objectives of the study was to compare the organization's performance in relation to the investigated KM practices with the perceived importance of these same practices. Both performance and importance were determined by the organization's members/participants in the survey. This analysis was deemed necessary in order to assess KM readiness and satisfaction and to highlight important areas for improvement.

Performance was not in fact rated by the participants; it was rather recorded as "In Use", "Not in Use", "Don't Know if in Use". Importance ratings were obtained using a four-point scale being, 1-"Not at all important", 2-"Somewhat Important", 3-"Important", 4-"Critital". Cross tabulations of importance ratings of individual KM practices with their respective usage ("In Use", "Not In Use") and a graphical representation of the results, produced Figure 45 below. For all of the KM practices the results ranged between 2.58 and 3.50. Thus, the figure was constructed starting from 2,00 – Somewhat important to 4,00 – Critical.

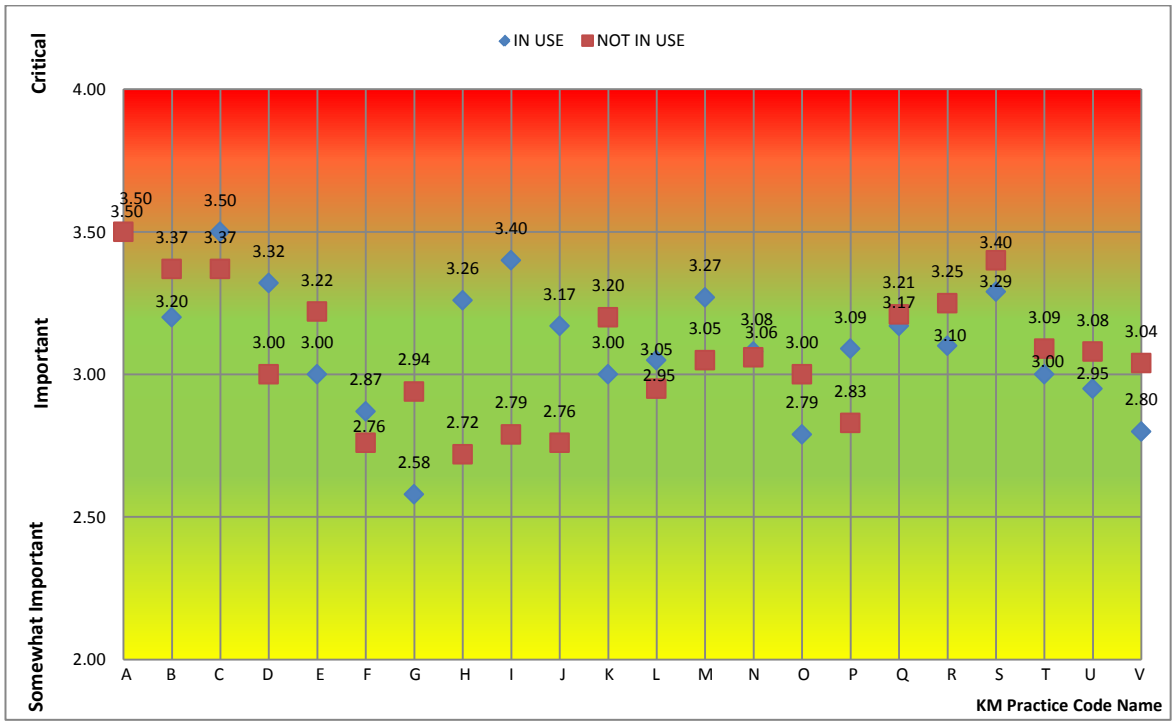


Figure 45. KM Practices; Performance (Usage) Vs. Importance

A first observation made here was that for most of the practices the cross tabulation of "in use" and importance was very close to the cross tabulation of "Not in use" and importance. In one case it even produced the same exact number (code A, 3.50). This factor played a role in the extraction of "safe" conclusions regarding congruence and gaps between KM use and KM importance which follows. Also, since it is possible that a cross tabulation produces a result which might be heavily influenced by one of the contributing variables before selecting any practices these were cross checked with the separate averages for usage recognition and importance of the specific practice.

Congruence and Gaps Identified between KM Use and KM Importance

To perform this part of data analysis I used the Importance-Performance Analysis (IPA) (Martilla & James, 1977) (see Section 4.5.1., Figure 24). A revised IPA grid (Figure 46) was developed on the recognition of practices as being in use or not. Thus, instead of performance being shown on a scale ranging from High performance to Low performance, as in the original IPA, the left side of the devised grid, which involves Sections 1 and 3, concerned KM practices recognized as not being used and the right side with Sections 2 and 4 those practices recognized as being used. KM practices were selected from Figure 45 avoiding cases where the two cross tabulations (in use and importance; not in use and importance) where very close one to the other. Since all of the investigated KM practices, both those recognized in use and those recognized as not in use, were considered important to some extent (>=2.58) Sections 3 and 4 which involve practices of low importance were not applicable in this case.

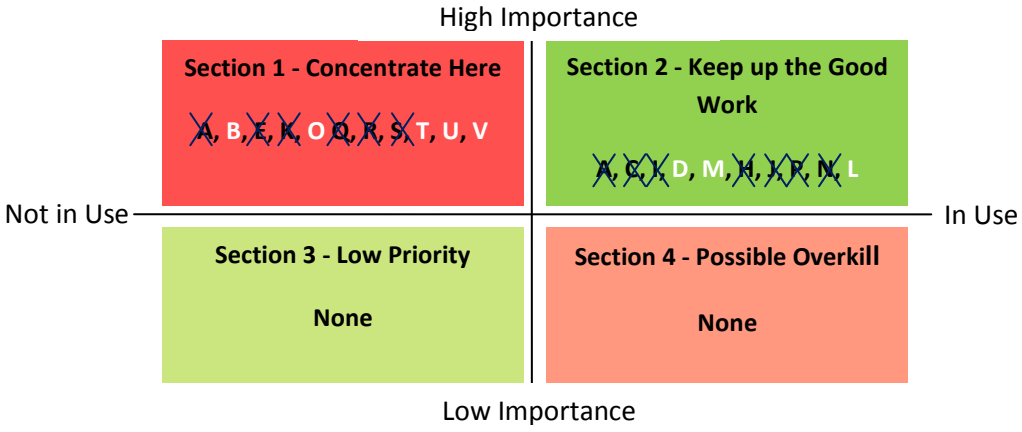


Figure 46. The IPA Grid of Performance (Usage) Vs. Importance of KM Practices (1st version)

Congruence in respect of usage and importance was identified in relation to the "In Use" KM practices which were also rated high in importance (3.0+ average). This group of practices belonged to Section 2 of the IPA-grid (Figure 46) which could be described as "Keep up the Good Work". Initially 10 practices were selected from Figure 46 being the ones with higher "in-use importance" than "not-in-use importance". From this list, A was crossed out since the two "in-use

importance" and "not-in-use importance" were the same for this practice. 6 more practices (C, I, H, J, P, N) were crossed out on the basis of having a higher percentage of participants recognizing them as not being available that those who recognized them as being available (Figure 27). From the remaining 3, L could remain silent since the difference of "in-use importance" and "not-in-use importance" for this practice was only 0.10. This left us with the following two practices as the ones which belonged to the "Keep up the Good Work" section: "The HEI uses partnerships or strategic alliances to acquire knowledge" (code D, 3.32), "The HEI regularly encourages employees to participate in project teams with external experts" (code M, 3.27).

Congruence would also exist in relation to those KM practices which were "Not in use" and had low importance averages (below 2.0 average). This group is equivalent to Section 3 of the IPA-grid (Figure 46) described as "Low Priority". As all of the practices were rated above 2.5, which could be described as quite important, no practices were placed in this category.

A gap was identified in Section 1 practices of the IPA-grid (Figure 46), the "Concentrate Here", which involves practices low in performance, though considered high in importance. In Figure 45 these practices were the ones which showed a high importance average but were "Not In Use". Initially 11 practices were selected from Figure 46 being the ones with higher "not-in-use importance" than "in-use importance". From this list, A was crossed out since the two "in-use importance" and "not-in-use importance" were the same for this practice. 4 more practices (E, K, R, S) were crossed out on the basis of having a higher percentage of participants recognizing them as being available that those who recognized them as not being available (Figure 27). Q was also excluded since the same percentage of participants recognized it as being used and not being used. From the remaining 5, T could remain silent since the difference of "not-in-use importance" and "in-use importance" for this practice was only 0.09. This left us with the following four practices as the ones which belonged to the "Concentrate Here" section: "The HEI has a value system or culture intended to promote knowledge sharing" (code B, 3.37), "The HEI creates systems to measure gaps between current and expected performance" (code U, 3.08), "In the HEI employees share knowledge / information by facilitating collaborative work by project teams that are physically separated ("virtual teams")" (code V, 3.04), and "The HEI provides informal training related to KM practices" (code O, 3.00).

Another gap exists in Section 4 of the IPA-grid (Figure 46) which includes practices which even though they were low in importance exhibited high performance. Such practices, described as "Possible Overkill", were not extracted for the HEI under study since, as already noted, all practices were rated above 2.5 – quite important.

Attempting to analyze things further a second version of the IPA Grid (Figure 47) was created. This showed that the majority of the KM practices recognized as being available ("In Use") (27.3%)

were important at the rate of 3.10. As for the rest of the in-use practices, a 49.9% of them were rated above 3.10 and only 22.6% were rated between 2.5 and 3.10. The majority of the KM practices recognized as not being available ("Not In Use") (31.8%) were again important at the rate of 3.10. 36.3% of the rest of them were rated above 3.10 and another 31.8% were rated between 2.5 and 3.10. (Importance ratings: 1-"Not at all important", 2-"Somewhat Important", 3-"Important", 4-"Critital")

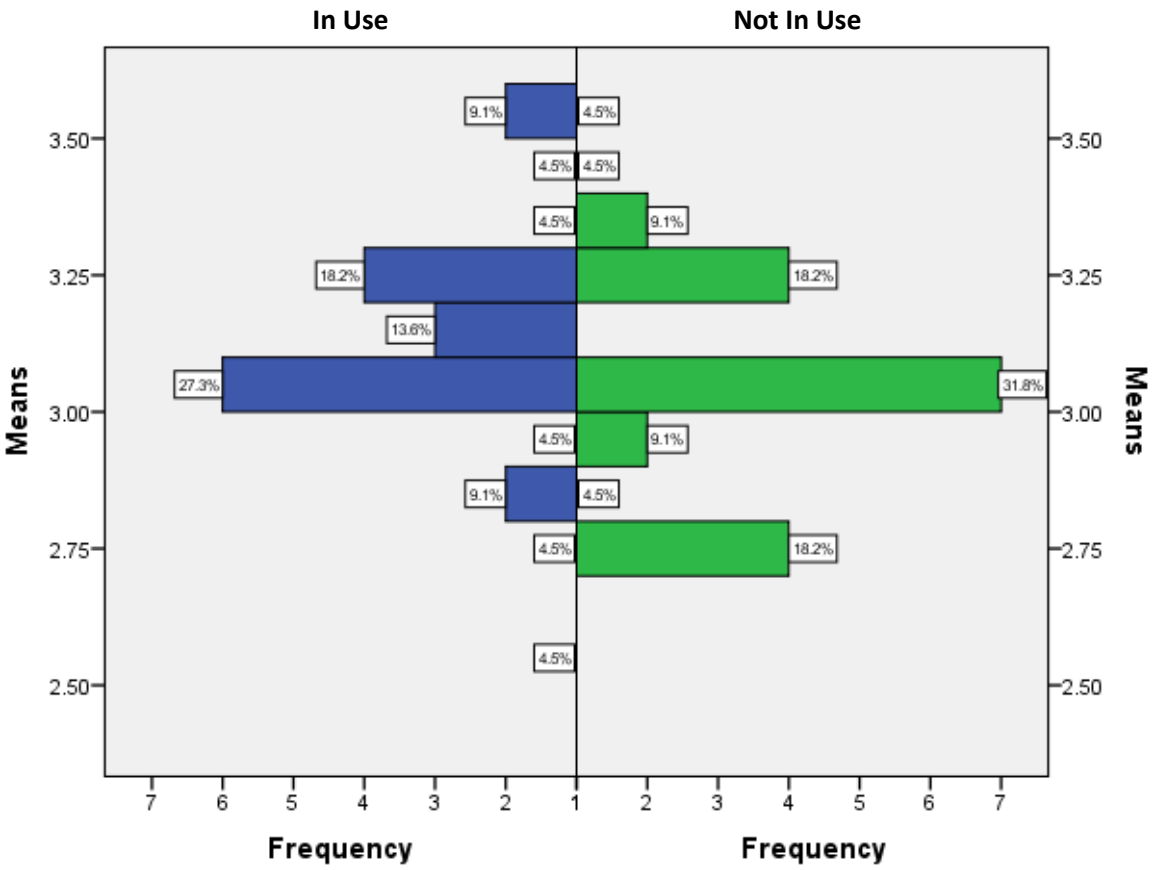


Figure 47. The IPA Grid of Performance (Usage) Vs. Importance of KM Practices (2nd version)

PART B: Learning Practices

The second section of the survey involved an investigation of the learning practices in use by the HEI. The survey participants were asked to recognize which of the 33 listed learning practices were currently in use at the HEI. Usage was rated using a 4-point scale providing for Never; Sometimes; Often; Always.

Table 28 was prepared to present the participants' views regarding learning practices in use at the HEI. Additional tables with cross tabulations were also prepared to relate learning practices usage with the different demographic groups (Tables 61-74). All of the prepared tables are presented in Appendix C.

In summary of the calculated statistics the following report was prepared. To review the detailed statistics one may refer to the individual tables (Appendix C).

Learning practices were coded according to Table 16 shown below.

Table 15. Learning Practices with Code Names

Learning practices – Code Names	Code
Individual Level In the HEI employees:	
openly discuss experiences in order to learn from them	A
identify skills needed for future work tasks	B
help each other learn	C
can get money and other resources to support their learning	D
can get time off to support learning	E
view problems and new directives as an opportunity to learn	F
are rewarded for learning	G
give open and honest feedback to each other	H
listen to others' views before speaking	I
are encouraged to state their opinion regardless of rank	J
treat each other with respect	K
spend time building trust with each other	L
Team or Group Level In the HEI teams/groups:	
have the freedom to adapt their goals as needed	M
treat members as equals, regardless of rank, culture, or other differences	N
focus both on the group's task and on how well the group is working	O
revise their thinking as a result of group discussions or information collected	P
are rewarded for their achievements as a team/group	Q
Organizational Level The HEI:	
uses two-way communication, such as suggestion systems, electronic communication, open meetings, etc., on a regular basis	R
enables its people to get needed information at any time quickly and easily	S
maintains an up-to-date database of employee skills	T
creates systems to measure gaps between current and expected performance	U
shares good-practices and lessons-learned among all employees	V
measures the results of the time and resources spent on learning	W
invites people to contribute to the organization's vision	X
gives people control over the resources they need to accomplish their work	Y
considers the impact of decisions on employee morale	Z
works together with the outside community to meet mutual needs	AA
encourages people to get answers from across the organization when solving problems	AB
leaders generally support requests for learning opportunities and training	AC
leaders share up-to-date information with employees about competitors, industry trends, and organizational directions	AD
leaders empower others to help carry out the organization's vision	AE
leaders mentor and coach those they lead	AF
leaders ensure that the organization's actions are consistent with its values	AG

Practicing Learning

Figures 48, 49 summarize learning practices' usage in the HEI as identified by the survey participants.

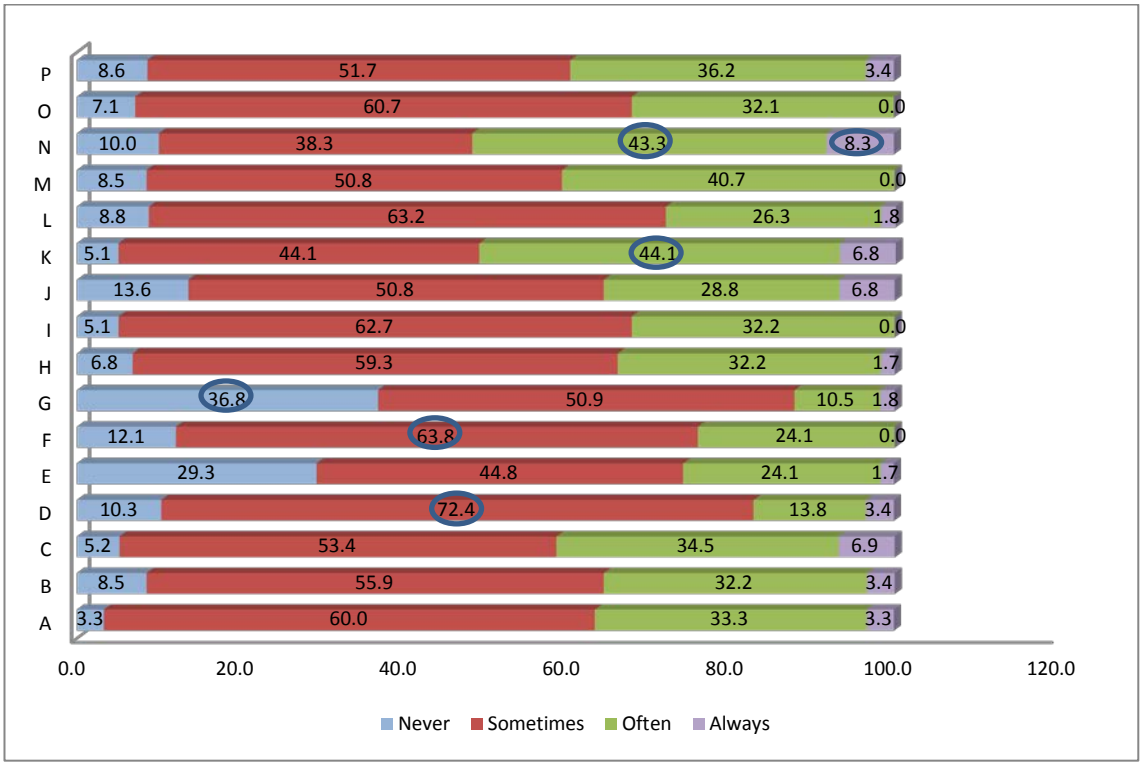


Figure 48. Learning Practices in Use at the HEI (A-P) (%)

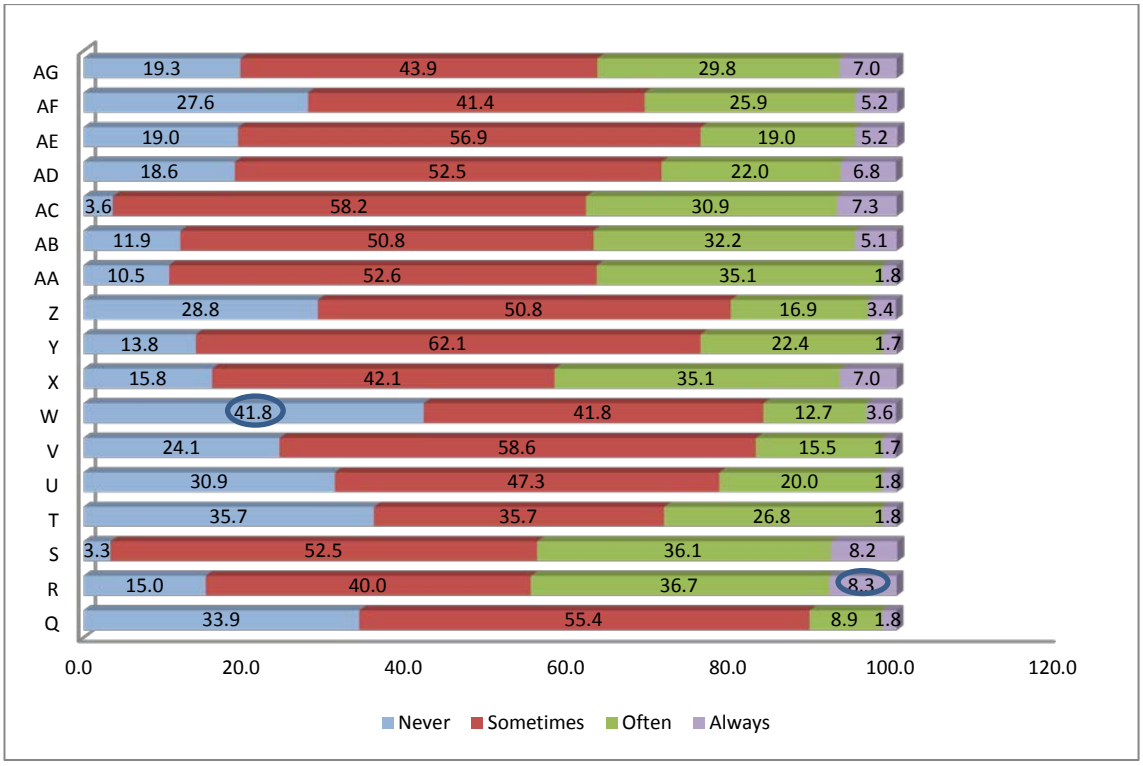


Figure 49. Learning Practices in Use at the HEI (Q-AG) (%)

It becomes immediately obvious from the above figures that all learning practices were selected by the majority of the participants to be sometimes in use in the HEI; except from "The HEI measures the results of the time and resources spent on learning" (code W) which was equally selected by 41.8% of the participants as "Sometimes" and "Never" used.

The highest "Never" used learning practices were according to the participants: "The HEI measures the results of the time and resources spent on learning" (code W, 41.8%), and "In the HEI employees are rewarded for learning" (code G, 36.8%). The top two "Sometimes" used learning practices involved: "In the HEI employees can get money and other resources to support their learning" (code D, 72.4%), and "In the HEI employees view problems and new directives as an opportunity to learn" (code F, 63.8%). In the group of "Often" used the two highest were: "In the HEI employees treat each other with respect" (code K, 44.1%), and "In the HEI teams/groups treat members as equals, regardless of rank, culture, or other differences" (code N, 43.3%). In the last group of "Always" used the top two learning practices involved: "In the HEI teams/groups treat members as equals, regardless of rank, culture, or other differences" (code N, 8.3%), and "The HEI uses two-way communication, such as suggestion systems, electronic communication, open meetings, etc., on a regular basis" (code R, 8.3%).

On average, participants identified 27.7 (83.8%) of the 33 learning practices listed as being used always, often, or sometimes. 17.3 (52.3%) of these 27.7 practices were actually identified to only occasionally being used (sometimes) thus only 10.4 practices were either often or always used (9.1 (27.7%) – often; 1.3 (3.8%) - always). The average for "Never" used practices was 16.1% which is equivalent to 5.3 out of 33 practices.

Figure 50 below, serves to study the mean weighted use of the individual learning practices on a scale of 1-4: 1-Never; 2-Sometimes; 3-Often; 4-Always.

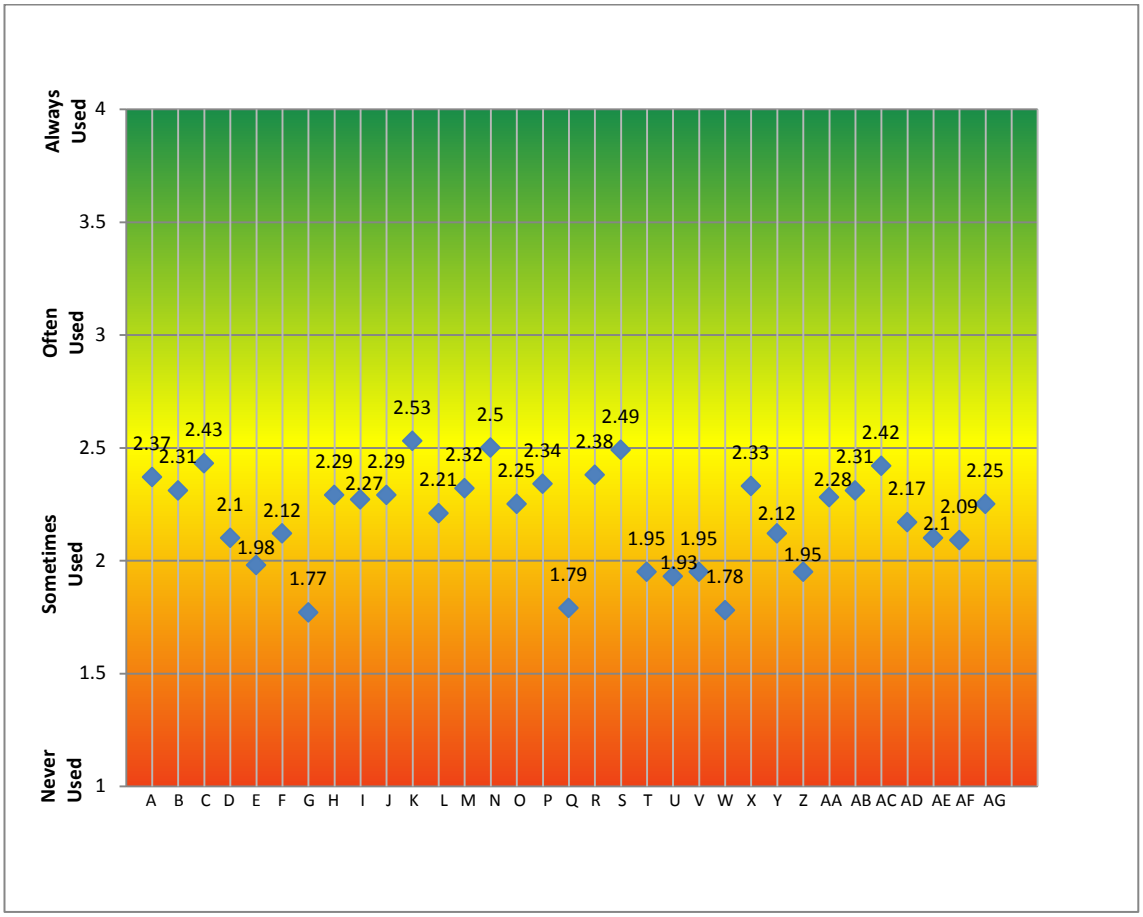


Figure 50. Mean Use of Learning Practices in the HEI

The mean use for all of the learning practices ranged between 1.77 and 2.53. This result suggests that though all of the learning practices were currently in use to some extent, efforts should be made to encourage their use so as to achieve a learning culture which would be characterized by continuous (Vs. irregular) learning. The top two practices with scores 2.53 and 2.50 respectively were the closest to 3.0 being "Often Used". The remaining 31 practices were below 2.5 and 8 of them were even rated below 2.0 "Sometimes Used".

The learning practices presented to the participants belonged to three groups being: Individual level practices; Team or Group level; and Organizational level practices (Table 16). The following figure (Figure 51) was prepared to present the use of learning practices in the three groups.

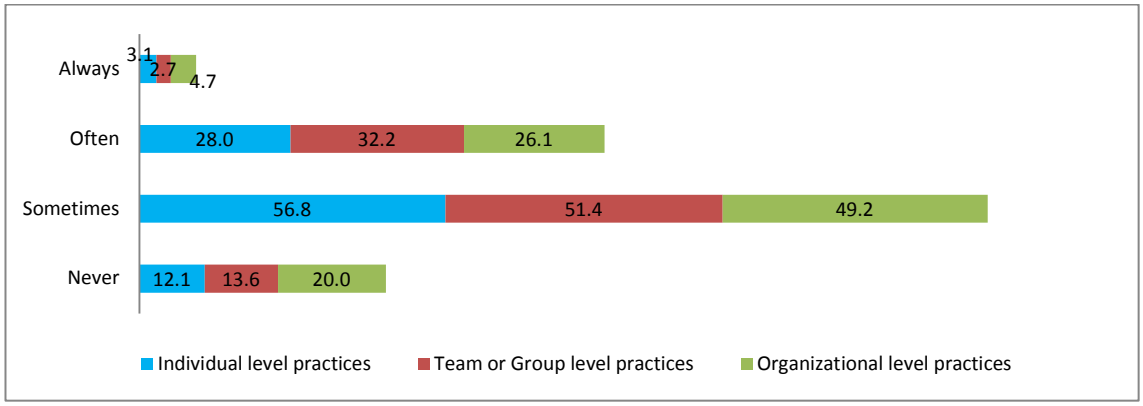


Figure 51. Groups of Learning Practices and Usage Percentages

The three groups did not seem to be reporting considerable differences. The percentages for "Always used" were very low for all three groups ranging from 2.7-4.7%. Better in regards to "Often used" were the "Team or group level" learning practices (32.2%) with the other two categories following closely. The highest "Sometimes used" practices involved practices at the "Individual level" (56.8%) and the highest average for "Never used" was for "Organizational level" practices (20.0%). Overall for all three categories, and as it was already observed, the occasional ("Sometimes used") use prevailed.

Individual level learning practices were overall used at 87.9% (56.8 – sometimes, 28.0 – often, 3.1 - always) and not used at 12.1%. Team or group level practices followed with 86.3% usage (51.4 – sometimes, 32.2 – often, 2.7 – always) and 13.6 no usage. Organizational level practices were indicated as currently in use in the institution, by an 80.0% of the participants (49.2 – sometimes, 26.1 – often, 4.7 – always) and not used by the remaining 20.0% (Figure 50).

Table 17 shows the top regularly (often/always) used learning practices by the different groups formed in the HEI under study according to demographics.

Table 16. Demographic Groups and Learning Practices in Regular Use

Demographic Variable	Values	Participated in this question (%)	Most regularly used learning practices (%)
Gender	Male	63.2	N (56.8), K (54.1)
	Female	36.8	P (47.6), K(45.5)
Age	20-29	1.8	K,N,P*(100.0)
	30-39	25.4	C (53.3), K(53.3)
	40-49	43.0	B (50.0), K(42.3)
	50-59	22.8	O(64.3), K,N,R(61.5)
	60+	7.0	E,R,S*(80.0)
Years of work experience	0-2	1.8	B,K,N*(100.0)
	3-5	0.9	B,C,L*(100.0)
	6-9	14.9	K,N,S(55.6)
	10+	82.5	N(51.0), K(50.0)
Years of management experience	0-2	27.5	K(62.5),S(43.8)
	3-5	10.8	B,K,N,S(50.0)
	6-9	24.5	A,J,AA(46.2)
	10+	37.3	N(76.2),R(70.0)

Years with current organization	0-2	9.8	AB(71.4),C,K,N*(66.7)
	3-5	9.8	O,X,AC(66.7)
	6-9	20.5	K(58.3),S(50.0)
	10+	59.8	N(57.1),K(50.0)
Employment Terms	Full-time	90.3	N(49.1),K(48.1)
	Part-time	9.7	K,M,N,R*(83.3)
School	Business	28.3	N(60.0),P,AA(57.1)
	Education	6.1	K,R,S*(100.0)
	Humanities, Social Sciences and Law	24.2	C(53.8),K(38.5)
	Sciences and Engineering	41.4	K,N(52.4)

* Other learning practices were also given the same percentage by this group

Considering all 25 groups which are created by the demographics variables, 19 groups have selected the practice "In the HEI employees treat each other with respect" (code K) and another 11 groups the practice "In the HEI teams/groups treat members as equals, regardless or rank, culture, or other differences" (code N) amongst the top in regular use learning practices in the institution.

This concludes the analysis of the Employee Survey. Following is the analysis of the Student Survey.

5.3.2. Student Survey

A small scale student survey was conducted to consider students' experiences of KM projects and practices available within the HEI as well as their perceived importance of the same practices. This study was considered to have a secondary, supporting role for any conclusions drawn from the employee survey. Since the student group is not in fact directly responsible for the KM practices of the HEI, students were just seen as possible users of any available KM projects and practices. Of course once KM is widely practiced in an institution certain KM practices could directly aim at satisfying specific student needs or needs of the general public being the society. Such deeper investigation and understanding of the students and their KM needs was beyond the purpose of the current study. In fact, the student population reached here was a very small percentage of the overall student group, just enough to shape an opinion regarding the familiarization of students with KM and certainly not to any extent sufficient in order to extract any statistical results which could be generalized for the overall student population.

The population in the student survey involved a convenience sample of 100 students. Data were collected directly from student respondents via an online questionnaire. Responding to the survey was optional as were also all of the questions in the questionnaire.

Certain edits were established to verify the consistency of the data once it was received. A total of 67 questionnaires were submitted of which 6 were written off as they involved either blank

submissions or submissions in which only the demographics section was completely or partially completed. The final number of questionnaires used for analysis was therefore 61 and the response rate was calculated to be 67%.

As it has already been emphasized above the study was to be used to simply shape the opinion regarding the experiences of students in relation to KM practices used in the HEI. The group of 67 students was therefore considered sufficient and no effort was made to get a response from more students.

Tables 29-32 with the statistics computed from the students' replies in the survey can be found in Appendix C.

Table 17. Student Demographics

Demographic Variable	Values	Responded	Valid (%)
Gender	Male	30	49.2
	Female	31	50.8
Age	17-20	38	62.3
	21-23	23	37.7
	24-26	0	0.0
	27+	0	0.0
Year of Study	First	44	72.1
	Second	3	4.9
	Third	14	23.0
	Fourth	0	0.0
School	Business	20	33.3
	Education	5	8.3
	Humanities, Social Sciences and Law	8	13.3
	Sciences and Engineering	27	45.0

The following figure shows the KM projects recognized as being available in the HEI.

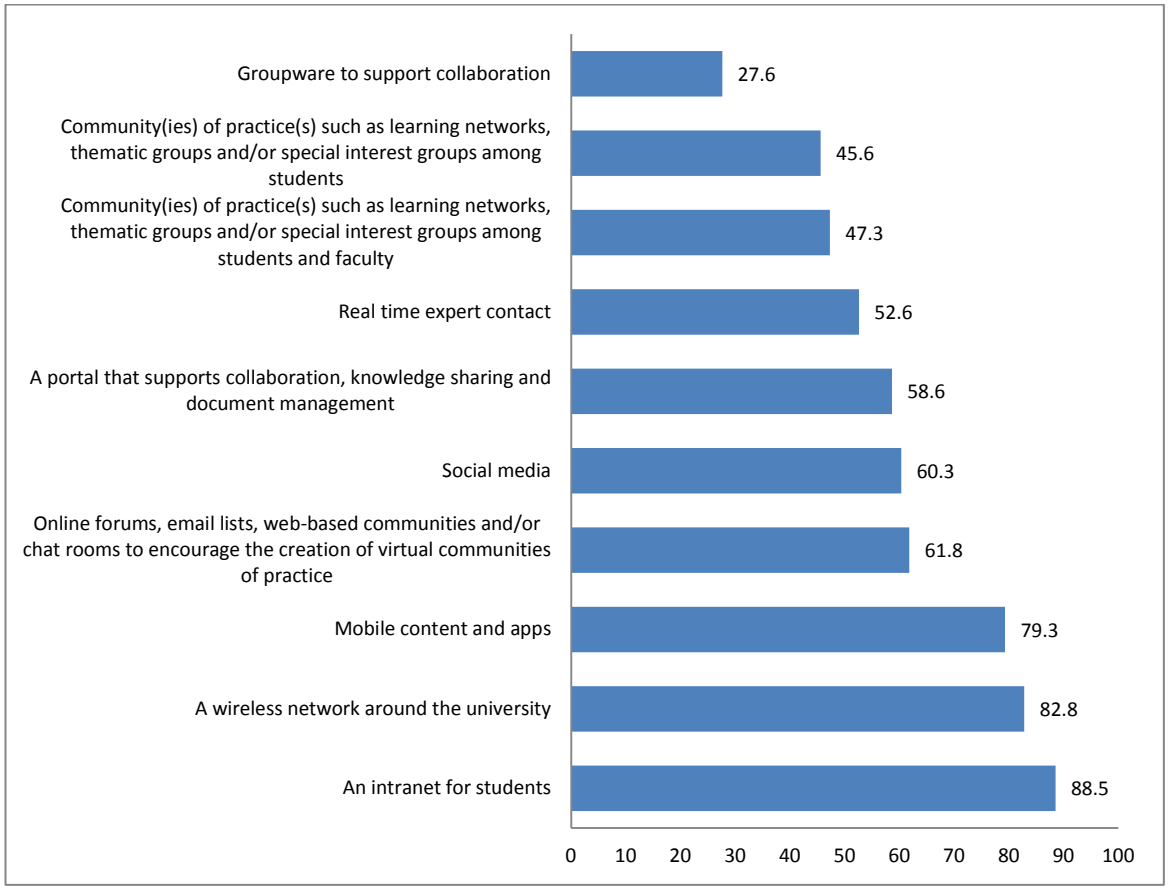


Figure 52. KM Projects Available in the HEI (%)

The majority of respondents recognized the following KM projects: an intranet for students (88.5%) and a wireless network around the university (82.8%). The students did not recognize: real time expert contact availability (24.6%) and a community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among students (21.1%). Students were not sure about the availability of: real time expert contact (51.7%) or a community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among students (33.3%) (Figure 52).

To reflect the importance attributed by the participants to the same list of KM projects, Figure 53 was prepared.

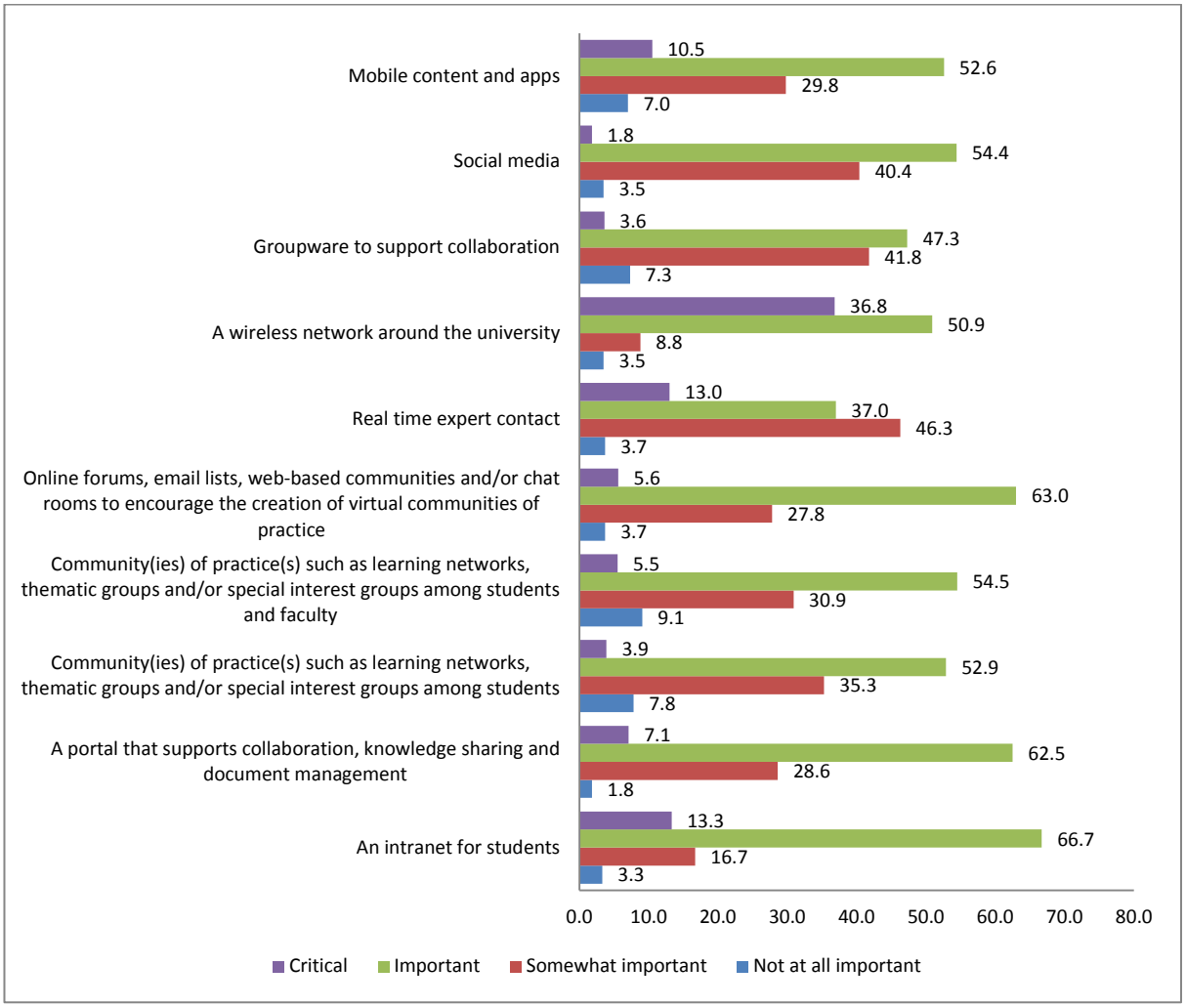


Figure 53. Importance of KM Projects (%)

The importance of the above projects, as judged by the students, revealed the following top two projects in each category:

- Not at all important: “Community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among students and faculty”, (9.1%); and “ Community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among students”, (7.8%)
- Somewhat important: “Real-time expert contact”, (46.3%); and “Groupware to support collaboration”, (41.8%)
- Important: “An intranet for students”, (66.7%); and “Online forums, email lists, web-based communities and/or chat rooms to encourage the creation of virtual communities of practice”, (63.0)
- Critical: “Real time expert contact”, (36.8%); and “An intranet for students”, (13.3%)

In relation to the KM practices recognized by the student participants as being available in the HEI Figure 54 was prepared.

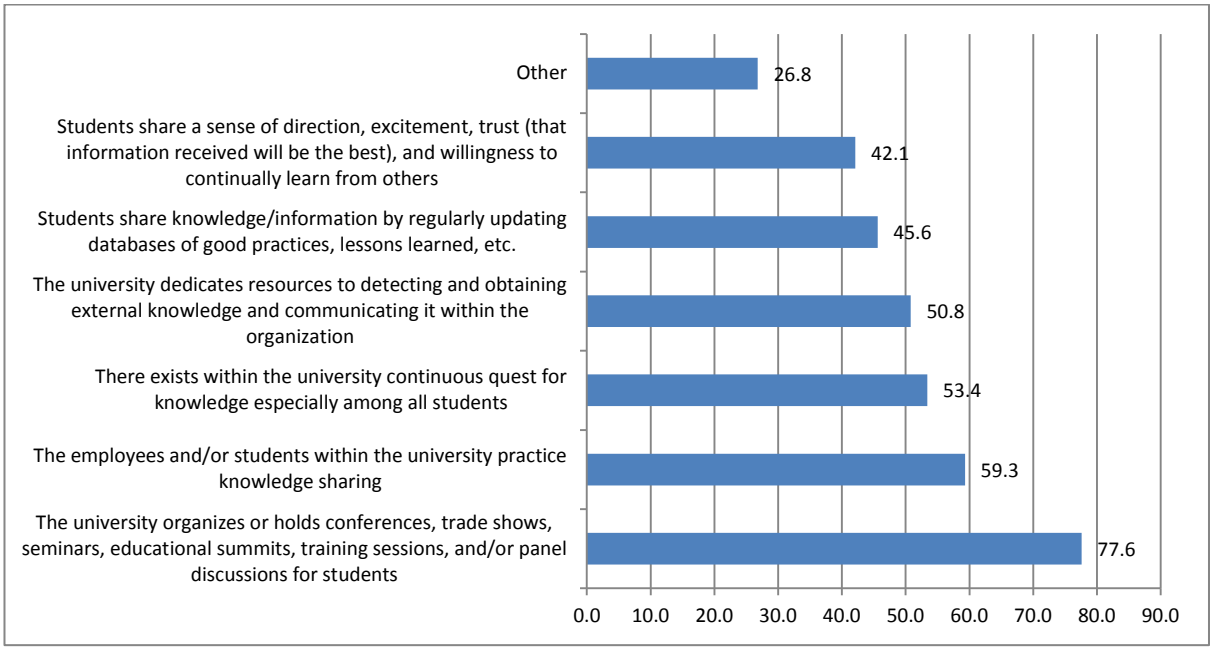


Figure 54. KM Practices Available in the HEI (%)

On average, participants recognized 3.6 (50.8%) of the 7 knowledge management practices listed. Between them the ones with highest recognition were "The university organizes or holds conferences, trade shows, seminars, educational summits, training sessions, and/or panel discussions for students" (77.6%), and "The employees and/or students within the university practice knowledge sharing" (59.3%). On the other end the ones recognized as being available by the fewest participants were "Other practices" (26.8%) and "Students share a sense of direction, excitement, trust (that information received will be the best), and willingness to continually learn from others" (42.1%) (Figure 54).

The importance of KM practices was also rated by the participants as in Figure 55. According to the majority of the students the most critical KM practice highlighted the existence within the university of a continuous quest for knowledge especially among all students (13.2%) and the most important KM practice was "The university dedicates resources to detecting and obtaining external knowledge and communicating it within the organization" (60.7%) (Figure 55).

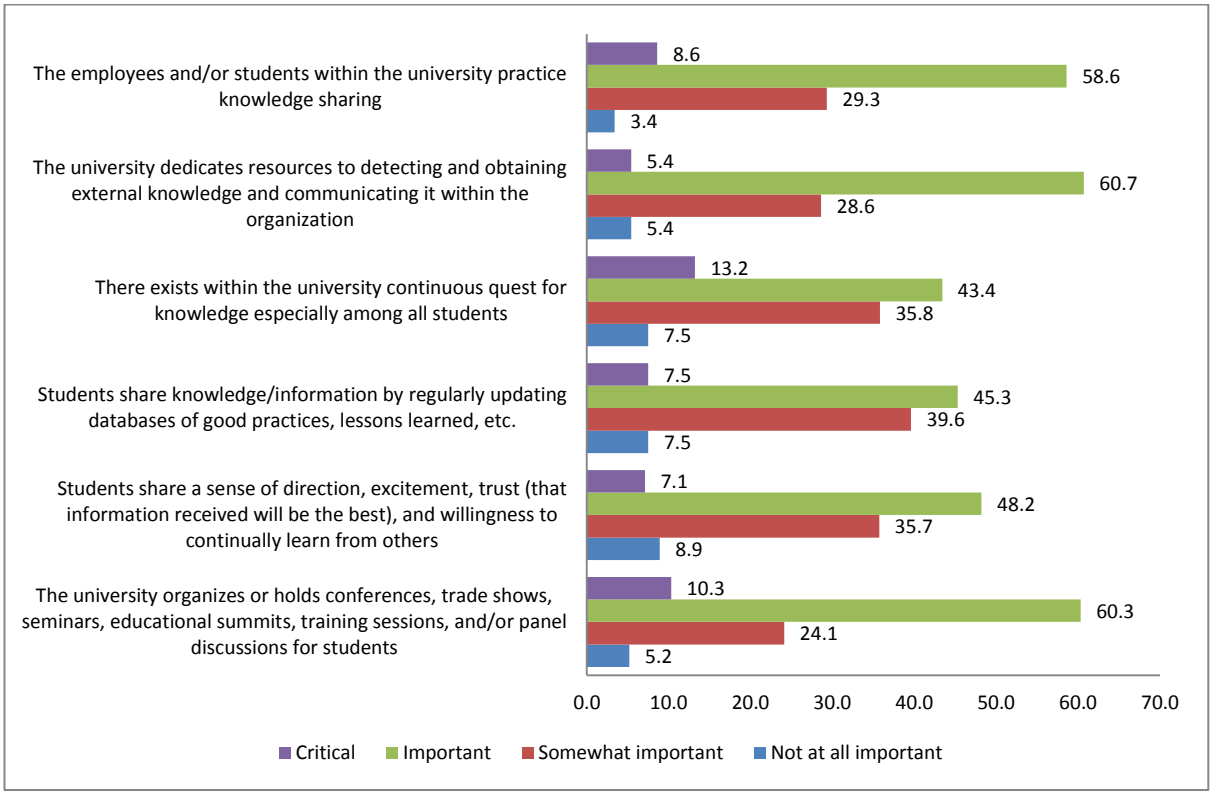


Figure 55. Importance of KM Practices (%)

This concludes the analysis of the Student Survey. Following is the analysis of the qualitative component of the survey which involved focus groups, with staff and faculty members, and personal interviews with top administration of the HEI.

5.4. Qualitative Data Analysis

The main survey objectives for the qualitative survey component were the same as for the quantitative component, being, to identify current KM practices in the HEI, establish stakeholder's perceptions of the "knowledge organization", identify needs and opportunities relating to KM, investigate the "as-is" and formulate the "to-be" KM-friendly and implementation positive environment. More specifically, the business practices of interest in this study were those used to support the collection, sharing, transfer, acquisition, and retention of knowledge by the institution and whether stakeholders found these practices effective.

The main stakeholders in this project were the educational institution itself, represented by top administrators, staff, and faculty members. Thus, to accomplish the above objectives focus groups with staff and faculty members were created. Additionally, interviews with top administrators were conducted.

5.4.1. Analyzing Top Administrators' Views (In-Depth Personal Interviews)

The qualitative data collected from the interviews held with the organization's top administrators, were transcribed, compiled and summarized.

Establish current practices in relation to key KM practices (the "as-is situation")

A. Collecting / capturing existing knowledge

A lot of useful data were found to be stored in different forms, some manual some electronic, by different departments. Examples of these data included: student data, employee data, data on facilities' utilization, library utilization, feasibility studies, quotations, etc. A big volume of various types of documents was stored in different offices. Examples included correspondence records; minutes of meetings such as Senate meetings' minutes; administrative and academic policies and procedures; several documents including a "Faculty manual", a "Student manual", an "Emergency evacuation plan" etc.; several informational booklets such as one for "Students with special educational needs"; etc. A lot of student-related data were captured and disseminated via a Student Information System (SIS), called Exelixis. Data about employee tasks and duties were recorded in job descriptions, performance appraisals/evaluations, some dedicated databases used for keeping track of certain employee activities, task allocation tables, etc. The recording of previous practices, best practices, or changes in practices for experience sharing, was not a common practice in the organization.

An interesting comment was made by an administrator who said:

> *"I suspect that people have their own documents and when they leave they throw them away."* (Top Administrator A)

This of course is a typical example of knowledge loss.

Another administrator said:

> *"I think that documents are collected but probably are not centrally tracked and they are not broadly available and accessible."* (Top Administrator L)

Real-time expert contact was used by administrators for IT, legal, taxation and other advice. Some of these experts were the institution's employees and others were external associates. Communication via the phone was mostly used.

Regarding the issue of seeking/using experts here is what some administrators said:

> *"I contact people based on my perceptions regarding their knowledge and expertise."* (Top Administrator J)

> *"I do not use a network of experts… There may be a need for ad-hoc networks to be created to serve different purposes e.g. different projects. I just have in mind some people specializing on different areas who I consult with when I need them."* (Top Administrator L)

Administrators were not making much use of Decision Support Tools. Some data analysis of student data was built in Exelixis – the SIS. Additionally, some analytics were used for marketing and digital marketing, advertising, recruiting efforts results' analysis, etc. There was also some built-in functionality in the catalogue and other systems used in the library and in the Learning Management Systems (LMS), mostly Moodle, used for course delivery.

In the absence of other dedicated or not knowledge bases, most administrators reached out to the Internet to fulfil most of their daily job-related information needs such as the need to stay informed about the competition, the local and international state of affairs in the political, economic, and other arenas, etc. Additionally, they checked their emails; received feedback from associates e.g. local and overseas agents; received feedback from students; looked for and at surveys, read articles, journals, reports, statistical analyses, the local and international press, etc.

> *"We do not have a bank of research areas/interests by different academics. We need a dynamic database to keep these data."* (Top Administrator L)

From all of the above it was possible to conclude that a great deal of data which recorded explicit knowledge were already available in the organization but very little tacit knowledge was recorded.

B. Organizing and storing knowledge

No authority/office was held responsible for the collection of the organization's documented knowledge at a centralized repository. There was a tendency to move from paper to electronic storage and many documents were scanned and stored. Some old documents were also stored by individuals/departments but no real data warehouses were maintained. Most document storage was done on an ad-hoc basis and individuals and departments stored what they believed was important. Such storage was done on people's personal computers or the email server of the organization for the documents which were transferred via email between organization members. This eventually created an abundant storage of the same exact documents. Some departments used cloud storage facilities such as the Dropbox. Furthermore, there was no Document Management System (DMS) in place at the organization and no Content Management System (CMS) either.

In the accounting department all supporting documents were stored and kept for ten years. Archives of students' past data were maintained in Exelixis – the SIS. Archives of emails were also kept on the email server. Some offices kept extensive archives of the data they were responsible for and some did not.

Several administrators raised their concern about the absence of a central repository and clear directions and responsibilities assigned to a specific office/officer for its maintenance.

One top administrator in fact said when asked about the maintenance of archives:

> *"No. Big problem. No archives; the university's history is being lost!"* (Top Administrator A)

It was a general impression that "documents are scattered around". Many administrators expressed the opinion that it was important to create a repository for the whole organization.

C. Disseminating/sharing knowledge between those who need it, when and where they need it

Intra-departmental and inter-departmental collaboration between associates was restricted to personal face-to-face contact, attendance in meetings, over the phone conversations and email exchange. Most tacit knowledge such as best practices, solutions, mistakes, etc. was shared in departmental meetings. Most knowledge that had been recorded in a written form was shared via email attachments. Some limited use of shared folders and cloud facilities for document storage and exchange was evident. Examples of such facilities used were the Dropbox for cloud storage and Google Docs, an online word processor which offers for real-time collaboration with other people. Most student-related data necessary to support different daily routine tasks were available via Exelixis - the SIS. Some, again student-related, information was passed on between certain departments, specifically the Admissions, Academic Affairs, and the Finance department, using bulletin boards included in Exelixis. A different board, called the Collection Info Board, was used to record financial conversations/agreements with the student. This board was of restricted access to a few individuals.

Additionally, some knowledge appears in publications, some regular and some one-time, which were published by the institution. Such publications included a Distance Learning Newsletter, a Corporate Social Responsibility Newsletter, a Student Affairs publication, the Sports Office newsletter, department and school publications, etc.

Effective and efficient communication channels are necessary for knowledge sharing. On this issue the following data was collected:

- **Establishing avenues of communication with students and faculties**

On the aspect of communication with the students, the student intranet network was the preferred mode of communication for most of the information which was of student interest such as the student's academic record, registration, grades, events organized etc. More student intranet networks were also in place for the delivery of course-related information; for example a Moodle intranet platform, a second Moodle intranet for distance learning courses and students, a Moodle intranet for PhD students and faculties (under development), etc. Students were many

times reached using text messages forwarded to their mobile devices, or through social media networks. The HEI's website was also very inclusive of a lot of information regarding the institution, programs of study, other services, events, associated organizations, etc.

On the aspect of communication of the administration with the faculties there was a faculty intranet network which was mainly enabling the faculty to administer the delivery of courses to students but was also used to support the faculty with certain tasks such as the ordering of books, as well as with information regarding academic and other policies, faculty evaluations, announcements, useful forms and other. Discussion forums were available via this intranet but they were not promoted or used. Most communication between the administration and the faculty body as well as between faculties, was again taking place via emails which were also used as the main form of disseminating knowledge included in emails as attachments.

- **Establishing avenues of communication with other staff members**

The absence of a staff network was seen by many administrators as a major drawback in the efforts of staff members, including administrators, to communicate and share information and knowledge effectively and efficiently.

Here are some of their comments:

> *"No intranet for the staff! – Forms should all be electronically available and submitted electronically."* (Top Administrator C)

> *"…we are planning to create a staff intranet. It has been delayed... The administration uses emails a lot because there is no staff intranet."* (Top Administrator I)

To direct all email communication, especially since such communication presented the main form of communication between the organization's employee force including the administration, several email lists had been created and were being utilized. Other than these, no web-based communities, chat rooms, or online forums were used for employee communication. Forums were sometimes used for course content delivery by faculties.

There was currently no portal available to support collaboration, knowledge sharing and document management. Also, there were no IT-enabled internal networks of knowledge employees, and no IT-enabled established Communities of Practice (CoP) such are learning networks, thematic groups, or special interest groups. Many established committees were of course active within the HEI, some academic such are Department committees, School committees, the Senate, etc., some administrative such are the Executive Council, a Marketing committee etc. More committees were established on an ad-hoc basis such as a committee

comprised of top administrators involved in Marketing, Communications, Recruitment and Admissions. Collaborations with external partners were also maintained via established bodies such are the Cyprus Rectors' Council, a Librarians' Union, several academic, professional, research, and other associations and networks.

Limited use of groupware software to support collaboration was made. The technology mentioned to be used included Dropbox for shared folder access and Google Docs.

Several administrators expressed the viewpoint that more need to be done in relation to disseminating/sharing knowledge and enriching communication, especially the internal communication between members of the staff. As some administrators put it:

> *"Communication between relating departments may not be developed to the necessary degree."* (Top Administrator L)

> *"Need to provide in a systematic way all this wealth of experience / knowledge / expertise so that someone will be able to use it if they take over a position in our units… We want to establish a system for the transfer of knowledge."* (Top Administrator B)

> *"If we do not have a platform and no infrastructure for knowledge sharing we cannot talk about motivation. I do not think a lot of the people are aware of this term, KM; maybe we do it without knowing it is that."* (Top Administrator J)

On the opposite end some other administrator said:

> *"There is good communication between relating departments."* (Top Administrator F)

As data were stored at the individual or department level it did not necessarily become accessible to others, individuals or departments, who might have had a use for them. In that case they selected to either maintain their own data or do without them.

The institution was doing a good job in organizing and/or holding conferences, trade shows, seminars, educational summits, training sessions, and/or panel discussions. Most of these were organized for the students, some for the faculty, and very few for the staff members. Sometimes they were being organized by the faculty but oftentimes they were organized by the appropriate HEI's offices. The problem was oftentimes attendance.

In conclusion, there seemed to be big room for improvement in many areas which related to knowledge management and the implementation of KM practices. In particular, administrators felt that immediate efforts should be directed to establishing collaboration channels especially between employee members of the organization. The absence of a portal to support collaboration, knowledge sharing and document management was especially noted. The

availability of a faculty and a student intranet was enabling the distribution of some information to these two groups. But, the unavailability of a basic staff intranet network was seen by several administrators as a drawback in their efforts to collaborate with colleagues, staff members, and to share knowledge and information. Plans for the creation of a staff network were on the way.

Identify any formal or informal KM strategy available within the HEI

Top administrators were asked for their opinion regarding the institution's actions towards proper planning and strategies being available to manage content. With the exception of the accounting department which had to have a strategy since the storage of supporting documents was necessary for auditing purposes, all other departments/offices were not following any strategy and their actions were ranging from well planned to ad-hoc as top administrators described them.

In particular, administrators expressed the following viewpoints:

> *"No strategy; ad-hoc. We understand what it is, we know we want it but no strategy was drafted towards it with time frames and actions to be taken …"* (Top Administrator D)

> *"… there is some central gathering of documents but one is not sure if updates are efficiently managed e.g. for documents/policies revisited by the Senate."* (Top Administrator F)

> *"We are reasonably good at it, but often we have to work under considerable pressure and financial limitations. If we had more time, some things would have been worked out more thoroughly. The structure is there but there may not be enough time to plan certain things. We may not have much time to reflect and plan as much."* (Top Administrator I)

More on the positive side of describing things one administrator said:

> *"We store what we need; we can easily find things and retrieve them. I do not think there is a problem here."* (Top Administrator L)

Another one was a bit sceptical about too much organization:

> *"There is a conflict between being an enterprising institution and being very well organized… Fearful to think that when you get organized you are less efficient… The emphasis is on following procedures and the problem may be that you lose a customer. You need stability in order to be organized."* (Top Administrator A)

In some administrative departments there was evidence of some KM strategy being present. For example:

"In my department for every task there are at least two persons who know how to do it. We have a table listing all tasks with a person with primary responsibility for each task and 2-3 others who can take over if necessary. Every now and then there is rotation of tasks." (Top Administrator I)

"As part of the performance appraisal/evaluations we conduct for all employees of the department every year, one of the most important targets is for one person to learn how to perform tasks which are handled by some other colleagues. This target can only be achieved with knowledge sharing. There is a questionnaire completed by the supervisor to document the evaluation in which the objectives of the year are assessed for completion and new targets are set for the next year. A target that is always present involves acquiring the know-how of someone else's work regarding a particular task or tasks which are decided in the meeting. This way the main tasks are covered by at least two personnel." (Top Administrator K)

There existed formal procedures to ensure that lessons learned are passed along to others doing similar tasks?

With the exception of a couple of departments which had formal procedures which required people to cooperate and share knowledge, in the rest of the departments such procedures were documented to some degree in procedure manuals and/or were part of some training, or were just shared in department meetings.

There had been changes in the processes within the HEI which encouraged the development and sharing of knowledge?

"Because the organization has become bigger it is important to have some means of sharing knowledge so that there is less duplication of everything. In the past it was easier because it was a smaller community of people." (Top Administrator E)

Organization growth, the adoption of an expanded and more complicated structure and the segregation of duties, both in the academic as well as the administrative structure of the organization increased the need for knowledge sharing.

Establish current leadership and management style, organizational structure and culture available in the HEI

Investigating culture

Asked about their opinion whether employees and students shared a sense of direction, excitement, trust (that information received will be the best), and willingness to continually learn from peers, administrators' viewpoints were mixed. Only about half of them answered with certainty that people are motivated and eager to learn.

Some viewpoints are cited below:

> *"No problem with motivation and trust."* (Top Administrator B)

> What you describe is "… *Part of the nature of academia and a university environment."* (Top Administrator D)

> *"If you provide them the means and the time people are willing to learn."* (Top Administrator E)

> *"Quite a number of employees, yes. In general there is motivation… Every time we approach people with information there is response, there is readiness, …"* (Top Administrator I)

Some administrators thought that people were currently not very motivated because of the economic crisis and its consequences, including salary reductions, etc.

A third group took a stance that excitement and willingness to learn as well as having a sense of direction may be a more general problem of the Cyprus society. They characteristically said:

> *"Has to do with the motivation of the person. Generally speaking our society is not characterized by a strong work ethic. Most people do not want to work."* (Top Administrator A)

> *"80% of our students are Cypriots. One of the problems I see is that students come to the university not by choice and not because they believe in what they are doing. In Cyprus 80% of high-school graduates continue their education in a university; they do so thoughtlessly. This takes away the excitement of learning; you do it because everyone does it and not because you believe in it. I believe that this absence of excitement is noticed in the class."* (Top Administrator L)

> *"…This is not a problem of individuals it is rather a bad characteristic of our culture. In other cultures things are different. Students sometimes are looking to receive inspiration from their lecturers. In Cyprus our discussions revolve around our everyday tasks; they lack spirituality."* (Top Administrator L)

Asked whether there existed within the institution continuous quest for knowledge especially among all employees, again the mixed replies which were received could definitely be perceived to mean that there was at least room for improvement. No one gave a straight "no" answer. Some rated it low, or said they were not sure, or that not all employees were characterized by such quest for knowledge. A number of them agreed that it was done at a voluntary, individual level without any directions or incentives given by management.

One administrator said:

> *"We do it for our job but not because there is an environment which stimulates it."* (Top Administrator H)

To oppose this with someone else said:

> *"The university culture is very positive in developing this further. Employees are eager to learn and share their experiences and expertise."* (Top Administrator B)

The HEI promotes internal cooperation among employees?

Most administrators thought that the institution indeed promoted such cooperation for example through the establishment of committees and especially between academics.

Additionally, the institution promoted external cooperation with industry consortia and other institutes. There were several examples to cite here: Internships, the Industry Liaison office, the Business Advisory Council, apprenticeships, the Erasmus program for students, faculty and staff, connections with professional bodies, collaboration with government agencies and ministries, etc. There were also several collaborative research projects which run with external partners.

Investigating organizational structure

> *"We are moving towards an understanding that things need to be done. We are more active sharing information than lets say 2 years before. At strategic level, information is shared between Senate and Council. At the operational level it is not structured and more on a day to day ad-hoc basis; may be this is as structured as it can be."* (Top Administrator D)

> *"People may not be aware of KM and its theory and how it could be structured, etc. but may be practicing it. I believe that there is reasonable exchange of information within departments. Sometimes it is more between departments that there may be a lack of knowledge sharing."* (Top Administrator I)

There are networks for transferring information between employees who interact with clients (students/parents) and other external agencies?

Enquiring about such a network, some administrators thought that the current Student Information System (SIS) – Exelixis had served as such a network but it needed to be updated. Others described a personal interaction by phone and emails. A number of them said that such communication was not very developed and that the communication between relating departments might also need to be developed further.

Study current organizational behavioural aspects and social interactions.

The employees and/or students within the HEI practice knowledge sharing?

The top administrators interviewed agreed that some individuals or groups/departments might be practicing knowledge sharing, also academics to some extent were doing it through for example the "School Research Day" which used to be organized regularly; but not recently. One may conclude that the majority of the administrators were possibly "not very satisfied" with the extent to which this was happening.

According to them:

> *"To some extent. Need to cultivate this."* (Top Administrator B)

> *"Could be cultivated. I had experiences in both directions (both positive and negative reactions)…"* (Top Administrator F)

> *"Not as much as I would want to."* (Top Administrator L)

As for knowledge sharing between students, administrators, most of whom are also academics, thought that:

> *"They (students) may practice it e.g. some students are studying together. We are not actively promoting it. We are more individualistic; we grade the student's work."* (Top Administrator A)

> *"Between students I do not think to that extend. Individuals may be doing it but not in a very organized way."* (Top Administrator I)

There has been evidence of positive and/or negative changes of behaviour among members of the HEI with regards to knowledge sharing?

The conflicting goals of an organization's departments may be sometimes influencing people's behaviours. "Positive or negative is a point of view", as one administrator put it. Others explained exhibited behaviours as possible, and to some extent expected resistance to change. A few recalled only positive behaviours. Knowledge sharing between academicians, especially in terms of research, can nevertheless be abused if those who receive the knowledge promote it as their own work without referencing the author(s). One person noted some reservations to a request for the creation of a shared folder and attributed these to the fact that people might not see its usage or might be concerned about protection and accessibility issues.

Other than some expected general resistance to change, the majority of administrators did not overall experience or anticipated any resistance to implementing any KM practices.

Following a researcher's introduction of a learning organization as one that learns continuously and transforms itself, with learning being a continuous, strategically used process, integrated with and running parallel to work, administrators were asked for their opinion whether the institution under study was a learning organization.

Administrators' opinions regarding being a 'Learning Organization' (LO)

These were some of the responses to the question whether the institution was a learning organization:

> *"If you do not want to learn you will fail. When the organization learns it does not mean that everybody learns. Not only learning about what you are doing; it is also learning new things."* (Top Administrator A)

> *"Yes, definitely but there is room for improvement."* (Top Administrator B)

> *"Yes it is but doesn't know it. It is ad-hoc. There is a business strategy, you need to break the strategy into actions given to individuals as tasks, processes, procedures, policies, action. There is no consistent way to receive feedback from individuals regarding the implementation of the strategy. Need reflection whether the intitial strategy has an effect. Example: Some years ago a lot of work was done to receive EFQM but there has not been any feedback or follow up on improvements; lack of measurement, inmaturity in being able to measure, people might be afraid in quantifying a measure of output; we only measure input."* (Top Administrator D)

> *"No. It is not done. I may give information to my replacement if I want and to the extent that I want."* (Top Administrator F)

> *"Yes; we cannot afford to do differently. We believe we learn from our mistakes and good practices. They may not be recorded."* (Top Administrator G)

> *"It is not part of the strategy. We are doing it but on an ad-hoc basis. It can be encouraged. Big room for improvement."* (Top Administrator H)

> *"Increasingly it is becoming. When it was smaller (the institution) it was different. Now we have grown a lot, it has to be part of a policy that we encourage it. In the administration some of the things we try to do require us to know a lot about university practices e.g. the EFQM qualification, the Investors in People qualification. All these are processes that to complete them successfully means a lot of sharing of knowledge about what goes on in the organization. Gradually, you do not do it whenever you are going through some process of assessment but is is a part of a culture. I think we are moving towards that direction."* (Top Administrator I)

"Definitely, yes." (Top Administrator L)

The last question was asked as a summary of the administrators' viewpoints. Administrators were asked to take a stance whether the institution was a knowledge organization, following a definition of a knowledge organization as a learning organization that practices KM efficiently.

Administrators' opinions regarding being a 'Knowledge Organization' (KO)

These were some of the responses to the question whether the institution was a knowledge organization:

"LO Yes. We are in process to become a KO. Moving towards the right direction." (Top Administrator B)

"Problems not recorded. Experts not involved in problem solving. To economize we need to spend." (Top Administrator C)

"Has the willingness to be but it is not structured everywhere. Even academic departments are not keeping a central database. One lecturer that teaches a course and another lecturer teaching the same course may not be sharing any information. Learning is not done in a structured way. We may be confusing the part of what is personal intellectual property and organizationally-collected intellectual property. … It is a problem of policy to achieve efficiency and effectiveness within departments. … There is input – we measure it. The output is not measured! We have the willingness to become a KO but we lack the structure and the how-to." (Top Administrator D)

"No. There is room for improvement to become both a LO and a KO. Some departments may be better at it than some other departments. I may know where to find information and who has it but someone not in an administrative position may not know who to talk to, or the procedure." (Top Administrator F)

"No. Big room for improvement in both directions." (Top Administrator H)

"We are developing but we are not a model of a LO or a KO. There is room for improvement." (Top Administrator I)

"No. Maybe we do sporadically and on an ad-hoc basis. I do not think we have sat down and really thought about it." (Top Administrator J)

"We are quite efficient but could be more efficient with the use of certain IT tools. For example, if we are looking for a document and to find it we need to make several calls

then definitely there is room for improvement. We lack KM efficiency." (Top Administrator K)

"… If you asked me whether we would succeed to replace some experienced employee without losing much of his/her knowledge I would say that we would to a 70%, or a percentage above average. Most of the things are documented but we could become a lot better. Between administrative departments since we know what each department is responsible for there is no confusion and no problem in approaching the right people, or those who have the knowledge when we need something." (Top Administrator L)

Before considering the final comments of administrators it is worth noting at this point that there were no dedicated budgets or spending for KM in the institution. "We provide funds when a need arises" an administrator said. This ascertainment could relate to some of the comments made below.

Identifying the need for knowledge management and other suggestions

Administrators' views often pointed out a need for KM practices and offered justification for KM efforts to be initiated even though not all felt comfortable using the term KM. These were some of their comments and/or suggestions:

"KM practice should be considered a critical success factor. The institution does not really measure the effectiveness of its KM practices. We need to invest diligently in KM." (Top Administrator B)

"There has not been a specific identification of the need for KM." (Top Administrator D)

"We need a system that will unite all the systems found in the different offices to bring all the knowledge together for people to use it." (Top Administrator E)

"I am still not sure if I fully understand the concept of KM. If it only involves the sharing of knowledge then that is something we do all the time. I am assuming there is something else behind it as well. I like this idea about a portal that will collect everything; I believe it will be very useful; we do not have it and it would be very important to proceed with such a portal's creation. … Most of the things are documented but we could become a lot better." (Top Administrator L)

"... It is something that I believe it is of paramount importance, that we should be using it and it is a matter of people getting accustomed to this culture of thinking." (Top Administrator J)

"We understand the importance of KM and transfer of knowledge but the main challenge for us is time. We need to invest if we want to develop this the right way so unless we have time to invest, both in terms of human resources and financial resources, we are going to develop something which is not going to give us the ultimate that we can get. We need to invest on it!" (Top Administrator B)

"There is commitment in the organization from people in this direction. Every time we approach people with information there is response, there is readiness, but sometimes it is hindered by the fact that people may not have the time to get involved in processes that would facilitate this process. … We are under-staffed in many departments due to financial constraints." (Top Administrator I)

"IT systems and support within the university is suffering. There are no systems that would allow the sharing of knowledge, sharing of documents, collaborative work, … I hope that the organization gets convinced about the need for more IT support and in particular the need for IT support for KM and that a more systematic approach is introduced relating to the introduction of IS in the organization. As a first step an MIS director could be appointed and be a member of the Executive Council so as to bring IS-related issues at this top decision-making body. All moves currently made are non-systematic and may be spasmodic but they are not recognized as such by the executive board and others who are not aware of what IT and IS have to offer." (Top Administrator K)

"There is great room for IT and IS utilization in the direction of KM." (Top Administrator L)

5.4.2. Analyzing Faculty and Staff Members' Views (Focus Groups Meetings)

Following the same approach followed in the analysis of the data received from the administrators, the qualitative data collected from the meetings with the focus groups of faculty and staff, were transcribed, compiled and summarized.

Focus Group 1 - Faculty

The focus group of faculties was formed to include seven participants, all senior faculty with several years of experience at the HEI. A detailed profile of the faculty participants was presented in Table 9 (Chapter 4).

Twenty two members of faculty had initially been invited via email to the meeting. Only three responded to the invitation and eventually participated in the meeting. Thus, a second invitation was extended to senior faculty of the four participating schools to eventually secure another four faculties to participate in the meeting. All participants were asked to sign a consent form stating their consent to participate in the focus group.

The meeting lasted fifty minutes from which the first ten were spent on a short presentation I made to explain knowledge and types of knowledge; knowledge management; knowledge management system: characteristics and benefits; why academic institutions need knowledge management. Certain clarifications on definitions were also offered.

Faculties' views regarding "What is a 'Knowledge Organization' (KO)?"

Following the presentation the group was asked to discuss: "What, in your opinion, constitutes a 'knowledge organization'?"

The discussion revealed the following:

> *"A knowledge organization is an organization which takes advantage of many of the things mentioned during the presentation in order to enable and to improve its business, keep its stakeholders happy, become more efficient, …"*
>
> *"An organization which tries to make the most out of the existing knowledge … organize its knowledge and use it for the benefit of the organization… optimize this usage"*
>
> *"In my mind, a knowledge organization is synonymous to a learning organization because in order to be effective with the transfer of knowledge and an exchange of knowledge it means that there is learning going on and this is to everyone's benefit."*
>
> *"A learning organization should be a knowledge organization. All organizations should be knowledge organizations but if they do not use knowledge effectively then they are not."*
>
> *"Knowledge is the result of learning. Knowledge is also the use of what you know; practice."*
>
> *"A knowledge organization is one which makes the knowledge transversal (available and accessible) inside the organization at the unit/department level."*

I summarized the group's raised points and presented the following slide (Figure 56) which defines and describes a knowledge organization.

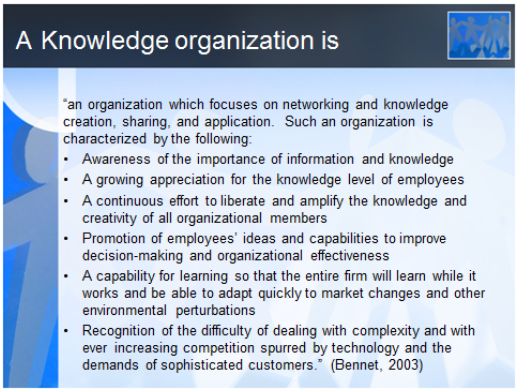


Figure 56. Definition and Characteristics of a Knowledge Organization; Source: (Bennet & Bennet, 2003)

Before any further discussion took place I distributed a short quiz among group members to determine the current state of knowledge management at the institution. The quiz and the interpretation of the data received were based on the work done by O'Dell (O'Dell, et al., 2004). Both of them can be seen in Table 19 below. Group's input to this short survey was inserted in a spreadsheet and analyzed on the spot. Table 20 and Figure 57 were later on created to summarize the results. The exercise yielded an average of 3.4 "Yes" responses and therefore the conclusion made was that the organization, according to this group's opinion, belonged to the first category of organizations described by "Just starting… While you obviously have recognized the benefits of knowledge management, you've got a significant amount of work ahead of you to incorporate the necessary concepts and processes." (O'Dell, et al., 2004).

Table 18. Survey to Determine KM State at the Organization; Source: (O'Dell, et al., 2004)

A Short Quiz ... to determine the current state of knowledge management at your organization. (O'Dell, et al., 2004)		
Please circle either the "Yes" or the "No" answer to each question. To the best of your knowledge:		
Is your organization doing anything it calls knowledge management?	Yes	No
Is your organization doing something that, although not called knowledge management falls under the definition of knowledge management (either the ones your organization uses or the one presented here)?	Yes	No
Does senior management understand and support knowledge management as a key to your organization's business strategy?	Yes	No
Does your organization as a whole know what knowledge it already has?	Yes	No
Is knowledge systematically transferred from one part of your organization to another?	Yes	No
Is technology used to effectively share knowledge within your organization?	Yes	No
Does the culture of your organization encourage people to share their knowledge and reward them for doing so?	Yes	No
Does your organization measure the impact or success of its knowledge management efforts?	Yes	No
Is there a general consensus in your organization about what knowledge management means?	Yes	No
If knowledge management is occurring, whether at the grassroots or the organizational level, does it have senior management support?	Yes	No
Are people specifically assigned to knowledge management activities?	Yes	No
Do the people who need it know who has it and how to find it?	Yes	No
Is knowledge consistently gathered from outside your organization for internal use?	Yes	No
Are people networks used to effectively share knowledge within your organization?	Yes	No
Is your organization taking full advantage of its knowledge to improve its products	Yes	No

and services?		
Number of "Yes" responses: XX		
Interpretation of result:		
0-5 "yes" responses: Just starting… While you obviously have recognized the benefits of knowledge management, you've got a significant amount of work ahead of you to incorporate the necessary concepts and processes.		
6-10 "yes" responses: You are on the right path to taking advantage of what knowledge management has to offer, but you have many areas yet to explore. Your next step is identifying the areas in which your organization is weakest and focusing your efforts there.		
11- 15 "yes" responses: You are well on your way to demonstrating best practices in knowledge management. Your "no" answers will indicate the areas in which your organization needs to improve. The goal in relation to any specific facet is to be doing it well enough that its positive impact is felt throughout your organization. From then on you should revisit and improve your practice if it is to deliver its maximum benefit.		

Table 19. Survey on KM State at the Organization; Data Analysis of Faculties' Focus Group

Question Number	Answered Yes (%)	Answered No (%)
1	4 (50%)	4 (50%)
2	7 (88%)	1 (13%)
3	2 (25%)	6 (75%)
4	0 (0%)	8 (100%)
5	0 (0%)	8 (100%)
6	4 (50%)	4 (50%)
7	1 (13%)	7 (88%)
8	0 (0%)	8 (100%)
9	0 (0%)	8 (100%)
10	1 (13%)	7 (88%)
11	3 (38%)	5 (63%)
12	2 (25%)	6 (75%)
13	2 (25%)	2 (75%)
14	1 (13%)	7 (88%)
15	0 (0%)	8 (100%)
Number of Responses	27 (3.4%)	93 (11.7%)

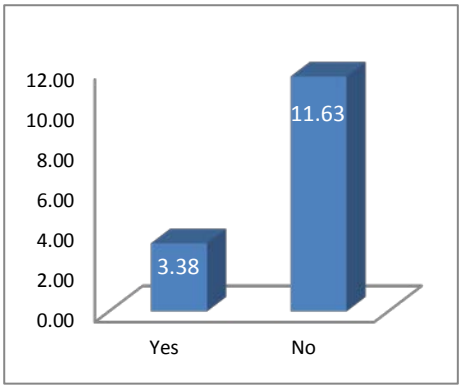


Figure 57. "Yes" Vs. "No" Responses Received From Faculties

The group stated their agreement with the resulting description of the institution's current KM state. One person said that the description is "kind of optimistic".

Faculties' views regarding "Is the HEI a 'Knowledge Organization'?"

Following the survey, the group was directed to discuss: "Is the HEI a knowledge organization?" The keys areas for discussion were presented in a slide (Figure 58) and the faculty members were asked to discuss the topic in terms of their experiences, knowledge, beliefs, expectations, needs, and attitudes towards KM and the establishment of a knowledge organization.

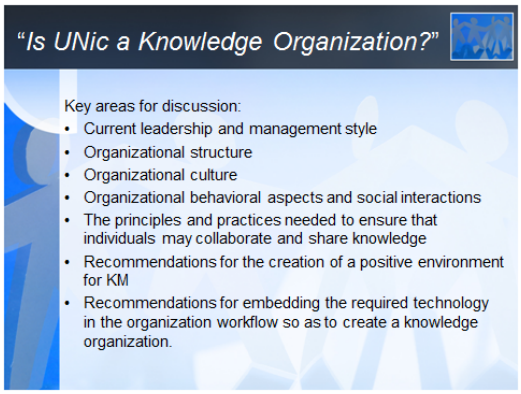


Figure 58. Knowledge Organization; Key Areas for Discussion

Some of the group's comments included:

"Social interactions are very important for all organizations. It is not just the dissemination of knowledge that should interest us, but the key is how people interact and collaborate to share the knowledge, along to the existence of a positive environment."

"A knowledge organization cannot materialize if it is creating a lot of extra work on top of people's normal work. There are examples of businesses who worked on trying to avoid this e.g. by tagging peoples' work. It is essential that the technology is embedded in the work flow and not considered as extra."

"People can be trained, if there is a willingness, how to speak to each other. A culture can be cultivated."

"Why should people take an initiative if their efforts are not rewarded? Quite often it is just a question of being recognized and appreciated."

"We need somebody to motivate the people and cultivate the culture."

"We need to follow graduates, get feedback about their work placement."

"What do you achieve/create with knowledge? You record history so that you avoid making the same mistakes. Any decision you have to take which is new, for which you had no prior experience, you need to justify scientifically. Are decisions in our organization justified? No. Do we repeat mistakes? Yes. So, we cannot be considered a knowledge organization. We do not acknowledge mistakes."

"We could also record best practices so as to invoke more best practices e.g. best practices in teaching."

".. It requires an individual and an organization value system to learn from past mistakes in order to go forward."

"… should work on the emotional level on keeping people happy."

"Teams of people sharing because of the need to collaborate e.g. when a new program is created there should be sharing between departments."

"An office should be appointed responsible for KM to identify what it takes to implement KM and do the follow up to see these implemented in the institution."

"A knowledge organization needs a system to screen information and feed it to the right people. Communities of interest and communities of practice could be created."

As a conclusion of the meeting I summed up: "To become a knowledge organization there needs to be a strategy and policies to implement the strategy, a sharing culture and a certain structure that would allow the flow of knowledge, and of course the right tools that would not mean overwork of the people; only then a knowledge organization can materialize and be effective and knowledge sharing can add to the organization's efficiency." The faculties, members of the focus group, agreed with the conclusion as a summary of their raised viewpoints.

Focus Group 2 – Staff

The focus group of staff members was formed to include seven participants, all senior staff with several years of experience at the HEI. A detailed profile of the staff participants is available in Table 10 (Chapter 4).

Twenty members of staff had been invited via email to the meeting. Seven responded to the invitation and eventually participated in the meeting. All participants were asked to sign a consent form stating their consent to participate in the focus group.

The meeting lasted for fifty minutes. The structure of the meeting was the same as that held with the first focus group of faculties.

Staff's views regarding "What is a 'Knowledge Organization' (KO)?"

Asked to discuss: "What, in your opinion, constitutes a 'knowledge organization'?", here is what some of the staff members said:

"The research office has for some time been trying to collect data about the research areas and interests of faculty."

"A KO must collect all of its knowledge starting with the explicit knowledge and enabling its sharing between departments and between external users."

"We have several functions running but they need to be connected so that there can be sharing."

"90% of knowledge may be tacit; how can you convert this into explicit knowledge."

"Years of experience in a position are not easy to be formulated and expressed into explicit knowledge. Only certain procedures may be documented in writing."

"Training of newcomers, mostly in regards to the use of the Student Information System – SIS, is a cumbersome task that burdens one or two people who are also loaded with a lot of other responsibilities. Many times end-user support is also offered by the same people who are in fact end-users themselves." On this issue the group was informed that an online manual of the SIS has just started in the form of a Wiki.

"This form of documentation, i.e., a Wiki may also be created for other areas of operations."

"People's jobs should be well documented."

"It is very time consuming to record all this. May be someone else should undertake this task. Some attempts were made in the past but there was no follow up and we have not been informed about any progress made."

"In our department we have created procedure manuals for our reception which is staffed by student assistants so that we do not spend time training new people every semester. So the initial effort and time spent may pay off in the long run."

"In the library we have documented our procedures which relate to the circulation desk."

"Currently, we have to refer to each department to sometimes get the information we need as there is no central point of access to inter-departmental data."

"Even if there are procedures and regulations sometimes these are bent."

I summarized the group's raised points and continued by presenting the slide of Figure 56 which defines and describes a knowledge organization.

The responses received by this focus group to the short quiz given to determine the current state of knowledge management at the institution are summarized in Table 21 and Figure 59 below. The exercise yielded an average of 4.3 "Yes" responses, as opposed to the 3.4 average of the first focus group of faculties. With this average the organization is still classified in the first category of new starters (O'Dell, et al., 2004).

Table 20. Survey on KM State at the Organization; Data Analysis of Staff's Focus Group

Question Number	Answered Yes (%)	Answered No (%)
1	5 (71%)	2 (29%)
2	5 (71%)	2 (29%)
3	2 (29%)	5 (71%)
4	1 (14%)	6 (86%)
5	1 (14%)	6 (86%)
6	3 (43%)	4 (57%)
7	3 (43%)	4 (57%)
8	2 (29%)	5 (71%)
9	1 (14%)	6 (86%)
10	3 (43%)	4 (57%)
11	2 (29%)	5 (71%)
12	1 (14%)	6 (86%)
13	1 (14%)	6 (86%)
14	0 (0%)	7 (100%)
15	0 (0%)	7 (100%)
Number of Responses	30 (4.3%)	75 (10.7%)

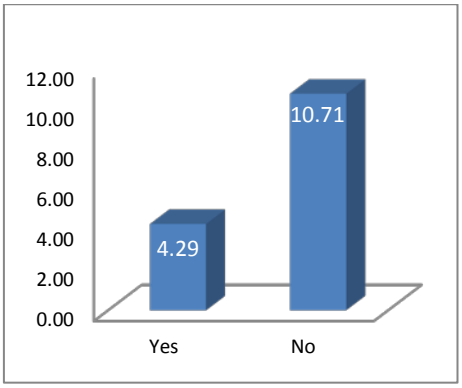


Figure 59. "Yes" Vs. "No" Responses Received From Staff

Staff's views regarding "Is the HEI a 'Knowledge Organization'?"

In the discussion on "Is the HEI a knowledge organization?" which followed some of the group's comments included:

"The behaviour of the organization, some internal procedures and requirements, are at large influenced and follow directions of external bodies such as the Ministry of Education and accreditation bodies."

"Maybe one of our weaknesses is sometimes a competition that may exist between departments. This may be caused by the size of the organization or the un-clear delegation of duties, overlapping of responsibilities, stress caused by increased work load…"

"Sometimes there is confusion in regards to responsibilities and jurisdiction of departments or individuals by the management or colleagues or students."

"Extra responsibilities are allocated to individuals without proper guidance. People continue doing all that they were doing in the past plus a lot more that is demanded of them even though some of these tasks could be allocated to new staff members."

"A re-engineering of positions with clear job descriptions may be necessary."

"The organization grows, with the support staff and the organizational structure not following as necessary."

"When you are small, communication is easy and simple but with our current size of about 400 employees, communication cannot just take place via meetings, phone and

emails. For example, we have been scheduling a staff intranet for four years but it has not yet started."

"A document management system is necessary because even if things are recorded and some are, the document form in which they exist is not searchable and not easily traceable."

As a conclusion of the meeting I summed up: "There is big room for improvement. There is no strategy towards knowledge management, no policies. Some efforts are made, some folders of documents are created, some are even shared between department employees for example using Dropbox and several departments started documenting some procedures. Some management officials are encouraging this effort. The new effort that is initiated with the Wiki could serve as a portal for the collection of useful data with ultimately organization and dissemination capabilities." The staff members of the focus group agreed with the conclusion as a summary of their raised viewpoints.

Both focus group meeting finished with myself thanking all members of the faculty for the contribution and leaving them with the following quote:

"A little knowledge that acts is worth infinitely more than much knowledge that is idle"
Khalil Gibran, Lebanese artist, poet, and writer

5.4.3. Analyzing Hard Data

To complete the investigation of current practices of the HEI hard data were collected from a number of sources. They involved internal documents (official and drafts), presentations, reports, etc. and they were collected from different departments, administrators and others, as well as from the organization's website.

The organization's website included, among other things, information about:

- Academic matters important to the academic community e.g. program offerings, the Diploma Supplement, admission requirements, academic information, financial information, the Student Handbook with academic policies and regulations, accreditation and recognition etc.
- News of interest to all e.g. new developments, new offerings, conferences, evens and various organized activities, university awards, various newsletters, etc.
- Research-related activities and output e.g. funded projects, research-related publications, etc.
- Services to businesses, the HEI's Corporate Social Responsibility report which describes numerous ways by which the institution is activated and offers services to the society.

- Multimedia access to a campus tour map.

The Student intranet was additionally giving to students, access to:

- Personal academic data.
- Platforms through which different learning material may be accessed.
- The university library and via the library to a number of subscribed databases.
- Important academic and other data e.g. housing, employment, etc.
- Various forms e.g. Application for a Minor, etc.
- Student life which includes information about different happenings, like club events, events, conferences, talks, etc.
- Online pre-registration and online payments.

The Faculty intranet was giving access to faculty to:

- Employment terms and conditions e.g. the Collective Agreement
- Academic policies and regulations
- Various forms e.g. Administrative Withdrawal, etc.
- A discussion forum (extremely underutilized and not promoted)
- Academic data including course, student, and exam-related reports
- Faculty evaluations
- Distance and e-Learning platforms
- The library.

Other useful documents collected included:

- A document on the HEI's Information Technology (IT) Strategy (draft – old document) (Appendix E).
- A presentation titled "EFQM Awareness 2014".
- A presentation on the vision, mission, and strategy of the HEI.

The collected documents were studied and important information was extracted and utilized as necessary at different sections of the study.

5.5. Conclusion

This chapter presented the research findings, analysis, and discussion on the perceived use of KM practices, the importance of this same group of KM practices, the reasons for KM use and the results of KM practices along with an investigation on learning practices all within the HEI under study. The groups which participated in the study involved all major internal stakeholders of the HEI being the faculty and staff members, the administration, and to a smaller extend the students

of the institution. The exploratory study involved both qualitative and quantitative measures which were analyzed separately within the chapter.

The following conclusions were possible to be drawn to summarize the overall standing of the institution in terms of KM use and learning practices.

Employees' (Faculty and staff members) viewpoints

On average, participants recognized 6.6 of the 22 knowledge management practices listed as being in use at the HEI, 7.7 practices as not being in use, and 7.7 more practices were not recognized as either being in use or not being in use. Replies regarding the recognition of KM practices in use between different schools ranged from 5.8 to 7.9 practices. Differences in KM use recognition also existed between other groups.

The majority of the overall employee population who participated in the survey perceived all of the individual KM practices and consequently all of the groups of KM practices which were formed, as highly important. Also, within schools all 22 practices were rated with 50.0% and above as either critical or important. Some differences exist regarding the top-rated critical/important practices both between schools as well as between other demographic groups.

The majority of the KM practices which were recognized as being used (77.2%) and the majority of the KM practices which were recognized as not being used (68.1%) were also considered important at the rate of 3.10 and above (out of 4.0). Importance of the practices used is of course positive but importance of practices not used is an area of high concern. Congruence was identified in relation to certain KM practices which while identified as being used were also perceived as being important. A gap was identified in relation to certain KM practices which while perceived to be highly important were identified as not being used.

According to the majority of the participating employees the first, most critical, reason for the use of KM practices is to protect the HEI from loss of knowledge due to employees' departures and then to help integrate knowledge within the HEI.

In regards to the KM performance (results) of the HEI, with the percentages of the overall population on the scale of very effective, all being very low (below 10%) one may conclude that employees found that the HEI's overall efforts of using KM practices were not very effective. The most effective result of using knowledge management was improving worker skills and knowledge and then the increased worker efficiency and/or productivity.

Examples of KM projects implemented within the HEI, according to the employee population, include an intranet for faculty, an intranet for students, and a wireless network around the university.

In regards to learning practices, on average, participants identified 27.7 of the 33 learning practices listed as being used always, often, or sometimes. The occasional use (sometimes) of these learning practices was actually responsible for 17.3 of these practices and only 10.4 practices were either often or always used. The top used learning practice was "In the HEI teams/groups treat members as equals, regardless of rank, culture, or other differences".

The viewpoints of faculty were also formulated from the discussions held and the conclusions reached from the meeting with the focus group of faculty. The majority of participants described the efforts made by the organization towards KM to be very preliminary with a lot of things deemed necessary in order to reach a satisfactory level of KM efficiency. They expressed the opinion that people should be motivated, a KM culture should be cultivated, a strategy should be developed, and IT should be utilized effectively and efficiently to enable KM practices to materialize without creating extra work for the employees of the institution.

Similarly, the viewpoints of staff members were additionally investigated during a meeting with the focus group of staff. It was the group's opinion that certain efforts were made at the departmental and the institutional level towards the recording of procedures which serve to describe people's work as it was the example of the office of the Executive Vice President for Administration, the Library, the Student Affairs' office, and other. At the institutional level a recent implementation of a Wiki was initiated to serve as an online users' manual for the Student Information System, Exelixis, which was used in common by several administrative departments of the institution. The current state of knowledge management at the institution, according to this group's participants, was again a very initial stage and several inadequacies were identified. The major one, according to the majority of the participants was the absence of a staff intranet. Some other requirements included a document management system, enriched communication channels and the need for the re-engineering of certain positions.

Students' viewpoints

The students recognized an intranet for students and a wireless network around the university as examples of KM projects available in the HEI. The top critical and important projects according to students were also recognized as being available by the majority (over 50%) of the students. A project which was perceived as somewhat important and identified to be available by only a small percentage of students was "groupware to support collaboration".

On average, student participants recognized as being available in the HEI, 3.6 of the 7 knowledge management practices listed. The one with highest reported use was "The university organizes or holds conferences, trade shows, seminars, educational summits, training sessions, and/or panel discussions for students" and the one reported highest as not being used was "Students share knowledge/information by regularly updating databases of good practices, lessons learned, etc.".

In terms of importance most students thought that the most critical KM practice is "there exists within the university of a continuous quest for knowledge especially among all students".

Top administrators' viewpoints

The qualitative study with participants the top administrators of the HEI revealed that there seemed to be big room for improvement in many areas which relate to knowledge management and the implementation of KM practices.

In fact, a great deal of data which record explicit knowledge were already available in the organization but very little tacit knowledge was recorded. A general impression, which was shared amongst administrators, was that "documents are scattered around". As data were stored at the individual or department level it did not necessarily become accessible to others, individuals or departments, who might have a use for them. Many administrators expressed the opinion that it was important to create a repository for the whole organization. Organization growth, the adoption of an expanded and more complicated structure and the segregation of duties, both in the academic as well as the administrative structure of the organization increased the need for knowledge sharing.

Administrators felt that immediate efforts should be directed to establishing collaboration channels especially between employee members of the organization. The absence of a portal to support collaboration, knowledge sharing and document management was especially noted. The availability of a faculty and a student intranet was enabling the distribution of some information to these two groups. But, the unavailability of a basic staff intranet network was seen by several administrators as a drawback in their efforts to collaborate with colleagues, staff members, and to share knowledge and information. Plans for the creation of a staff network were on the way.

Most communication between the administration and the faculty body as well as between faculties, was taking place via emails which were also used as the main form of disseminating knowledge included in emails as attachments. Students were reached via the student intranet and sometimes by text messages forwarded to their mobile devices, or through social media networks.

As mentioned already there was at the time no portal available to support collaboration, knowledge sharing and document management. Also, there were no IT-enabled internal networks of knowledge employees, and no IT-enabled established Communities of Practice (CoP) such as learning networks, thematic groups, or special interest groups. Several administrators expressed the viewpoint that more needed to be done in relation to disseminating/sharing knowledge and enriching communication, especially the internal communication between members of the staff and between relating departments. On an individual or inter-group/inter-

departmental level some knowledge sharing existed but the majority of the administrators were "not very satisfied" with the extent to which this was happening.

The institution was doing a good job in organizing and/or holding conferences, trade shows, seminars, educational summits, training sessions, and/or panel discussions. Most of these were organized for the students, some for the faculty, and very few for the staff members.

In regards to planning and the existence of a KM strategy there was no institution-wide KM strategy and the actions of most departments/offices towards KM were ranging from well planned to ad-hoc as top administrators had described them. With the exception of a couple of departments which had formal procedures which required people to cooperate and share knowledge, in the rest of the departments such procedures might have been documented to some degree in procedure manuals and/or might be part of some training, or just be shared in department meetings.

The investigation for the existence of a KM-enabling culture within the institution revealed mixed viewpoints/opinions from administrators. Only about half of them answered with certainty that people were motivated and eager to learn. A culture of practicing a continuous quest for knowledge especially among all employees did not seem to be clearly characterizing the institution on its whole. A number of administrators agreed that such quest existed on a voluntary, individual basis without any directions or incentives given by management. Nevertheless, most administrators thought that the institution promoted internal cooperation among employees for example through the establishment of committees as it also promoted external cooperation with industry consortia and other institutes for example via internships, the Industry Liaison office, the Business Advisory Council, apprenticeships, the Erasmus program for students, faculty and staff, connections with professional bodies, collaboration with government agencies and ministries, etc. There were also several collaborative research projects which run with external partners.

Most administrators agreed in describing the HEI as a learning organization, i.e., as one that learns continuously and transforms itself, with learning being a continuous, strategically used process, integrated with and running parallel to work. The majority also agreed that even though steps are taken towards implementing KM, the organization could not be described as a knowledge organization but there was commitment from people in the organization in this direction.

In the following chapter I reflect on the findings of the above analysis and offers recommendations which could be planned as short, medium, and long-term actions leading the way to KM.

Section III

Conclusions and Recommendations

Chapter 6 – Reflection on Findings;
Recommendations

Chapter 7 – The Case Study

[6]

Reflection on Findings; Recommendations

This chapter reflects on research findings and includes recommendations for short, medium and long terms actions.

"No amount of sophistication is going to allay the fact that all your knowledge is about the past and all your decisions are about the future." -- Ian E. Wilson

CHAPTER 6: REFLECTION ON FINDINGS; RECOMMENDATIONS

6.1. Introduction

Chapter 5 had presented the research findings from both the qualitative and the quantitative surveys conducted. The overall conclusion was that there was considerable potential for improvement in many areas which relate to knowledge management and the implementation of KM practices. Measures could also be taken in the direction of improving the learning practices used in the HEI even though survey results in relation to the use of learning practices were better than those relating to the use of KM practices. Following the general direction of a problem solving approach, by which to address the identified needs one may decompose them and consider each one separately in order to address the whole issue, it is the aim of this chapter to consider the necessary ingredients for the successful implementation of KM towards the attainment of a "knowledge organization" status which in fact, includes the status of a "learning organization" as well.

In Chapter 6 I reflect on the survey findings and make recommendations to the executive management of the HEI for specific corrective actions. An action plan organizing suggested actions into short-, medium-, and long-term actions is suggested. The chapter is completed with a summary of the work completed so far and an evaluation of the accomplished research objectives. The chapter could serve as an Executive Summary.

6.2. Reflection on Research Findings

In the introduction which I gave to executive administrators during the conducted interviews, I used the following definitions:

- A Learning Organization (LO) is one that learns continuously and transforms itself. Learning is a continuous, strategically used process, integrated with and running parallel to work. LOs must demonstrate three key components: 1) systems-level, continuous learning; 2) this learning then generates and manages knowledge outcomes; and 3) these outcomes lead to improvement in the organization's performance and value. (Watkins & Marsick, 1993)
- Knowledge Management (KM) involves any systematic activity related to the capture and sharing of knowledge by the organization.
- A Knowledge Organization (KO) is a Learning Organization (LO) that practices KM efficiently.

There is in fact a general agreement that a knowledge organization must, of necessity, become a learning organization so that the entire firm will learn while it works and be able to adapt quickly to market changes and other environmental perturbations (Bennet & Bennet, 2003). On the

other hand the learning strategy of the organization should take into consideration and satisfy the needs of KM.

The analysis of the exploratory study led to the following conclusions:

6.2.1. Learning Organization

Overall conclusions

- The members of the HEI, faculty and staff, identified all of the investigated learning practices as being currently (2014) in use to some extent in the HEI.
- The members of the HEI identified all three groups of learning practices being the individual, group or team and organizational level practices as being used.
- Learning practices were not regularly ("Often") used in the HEI.

The above conclusions were supported by the findings of both the quantitative and the qualitative surveys. Some highlights of these findings follow:

The mean use for the 33 learning practices which were investigated was between 1.77 and 2.53 on a scale of 1-4: 1-Never Used, 2-Sometimes Used, 3-Often Used, and 4-Always used. Most practices were rated above 2 and below 2.5 an area which could be described as occasional or irregular use (see Figure 49, Chapter 5).

Thus, a conclusion reached was that the members of the institution, faculty and staff, identified most learning practices as being currently in use to some extent. Nevertheless the necessary steps should be taken in order that the organization could achieve a learning culture which would be characterized by continuous and not irregular learning.

On average, participants identified 83.8% of learning practices listed as being used always, often, or sometimes by the members of the institution. The occasional use (sometimes) of these learning practices was actually responsible for 52.3% of these practices and only 31.5% of the practices were either often or always used (27.7% - often used, 3.8% - always used). Another 16.1% were not used at all. Between the regularly used (often or always) practices, the top-used learning practice was "In the HEI teams/groups treat members as equals, regardless of rank, culture, or other differences" (51.6%). The highest "Never used" practice was "The HEI measures the results of the time and resources spent on learning" (41.8%).

As learning practices were grouped in "Individual", "Team or Group", and "Organizational" level practices it was also interesting to look at the use of learning practices in the three groups. The occasional (sometimes) use of learning practices continued to be highest for all three groups. Individual level learning practices were overall (sometimes, often, or always) used at 87.9%, team

or group level practices followed with 86.3% usage and organizational level practices were indicated as currently in use in the institution, by an 80.0% of the participants.

An overall conclusion from the above could be that the high percentage – 83.8%, of identification by the institution's employees of learning practices in use in the institution, and the 80.0% and above use of practices by all three groups (individual, group or team, organizational), supported the previously reached conclusion that the members of the institution believed that all learning practices were in use, to some extent in the institution.

The above conclusion was also reinforced by the qualitative study analysis. More specifically the majority of the top executives agreed that the institution was a learning organization but learning practices should be planned and structured more carefully. Below are some of their comments:

> *"Yes, definitely but there is room for improvement."* (Top Administrator B)

> *"Yes; we cannot afford to do differently. We believe we learn from our mistakes and good practices. They may not be recorded."* (Top Administrator G)

Faculty and staff members also reported some learning practices but were cautions in labeling the institution as a learning organization. These were some relevant comments made by faculty and staff members:

> *"What do you achieve/create with knowledge? You record history so that you avoid making the same mistakes. Any decision you have to take which is new, for which you had no prior experience, you need to justify scientifically. Are decisions in our organization justified? No. Do we repeat mistakes? Yes. So, we cannot be considered a knowledge organization. We do not acknowledge mistakes."* (Faculty Member)

> *".. It requires an individual and an organization value system to learn from past mistakes in order to go forward."* (Faculty Member)

> *"Training of newcomers, …, is a cumbersome task that burdens one or two people who are also loaded with a lot of other responsibilities. Many times end-user support is also offered by the same people who are in fact end-users themselves."* (Staff Member)

> *"In our department we have created procedure manuals for our reception which is staffed by student assistants so that we do not spend time training new people every semester. So the initial effort and time spent may pay off in the long run."* (Staff Member)

Corrective actions

Corrective actions should involve the HEI taking action towards:

1. Taking measures and implementing appropriate courses of action which would enable, reinforce, and establish learning practices amongst the organization force;
2. Devising appropriate mechanisms to encourage, motivate, and reward employees for their contribution to learning;
3. Management actively engaging in all learning practices and thus setting an example for the whole organization;
4. The HEI raising its expectations, and setting realistic standards which should be revised as necessary;
5. The HEI measuring learning accomplishments at the individual, team and group level, as well as at the organizational level.

All practices, existing and new ones should be described with specific deliverables which would make them more tangible to users and would enable the measurement of their outcome. In fact, evaluation must form a regular practice especially in relation to those factors and practices considered critical in terms of becoming a learning organization. All efforts should be made to embed learning practices in the processes and the daily routine of employees so as to achieve a learning culture which would be characterized by continuous learning.

6.2.2. Knowledge Organization

Overall conclusions

- The majority of top administrators realized the need for KM. The remaining administrators realized the need for the functionalities offered by KM without recognizing the name.
- The general feeling of top administrators, faculty and staff was that the HEI could not at the time be characterized as a knowledge organization.
- There was overall low recognition of KM practices in use in the HEI.
- There was low recognition of KM practices by the different demographics' groups which participated in the survey.
- Inefficiencies were identified in all areas of KM implementation including the capturing of knowledge, especially tacit knowledge, the organization of knowledge in ways that enable the easy access, as well as in the dissemination of knowledge.
- Inadequacies were also identified in relation to a KM strategy, a KM-enabling culture, incentives and motivation for knowledge sharing given to employees, as well as the availability of the necessary ICT to support both the activities of learning and KM.
- Incentives given by the HEI for KM practices were very low.

- There were high percentages of ignorance on behalf of employees regarding the availability or not of specific KM practices.
- The majority of the employee population perceived all of the investigated KM practices as being highly important.
- Congruence was identified in relation to certain KM practices which while identified as being used were also perceived as being important.
- A gap was identified in relation to certain KM practices which while perceived to be highly important were identified as not being used.
- The majority of the employee population believed that the main reasons for the use of KM practices was to protect the HEI from loss of knowledge due to employees' departures and then to help integrate knowledge within the HEI.
- Employees believed that the HEI's overall efforts of using KM practices were not very effective.

The above conclusions were supported by the findings of both the quantitative and the qualitative surveys. Some highlights of these findings follow:

Administrators supported that a great deal of data which recorded explicit knowledge were already available in the organization but very little tacit knowledge was recorded. A general impression was shared amongst administrators that "documents are scattered around". As data were stored at the individual or department level it did not necessarily become accessible to others, individuals or departments, who might have a use for them. Many expressed the opinion that it was important to create a repository for the whole organization. Organization growth, the adoption of an expanded and more complicated structure and the segregation of duties, both in the academic as well as the administrative structure of the organization increased the need for knowledge sharing.

Administrators felt that immediate efforts should be directed to establishing collaboration channels especially between employee members of the organization. The absence of a portal to support collaboration, knowledge sharing and document management was especially noted. The availability of a faculty and a student intranet was enabling the distribution of some information to these two groups. But, the unavailability of a basic staff intranet network was seen by several administrators as a drawback in their efforts to collaborate with colleagues, staff members, and to share knowledge and information. Plans for the creation of a staff network were on the way.

Most communication between the administration and the faculty body as well as between faculties, was taking place via emails which were also used as the main form of disseminating knowledge included in emails as attachments. Students were reached via the student intranet

and sometimes by text messages forwarded to their mobile devices, or through social media networks.

As mentioned already there was currently no portal available to support collaboration, knowledge sharing and document management. Also, there were no IT-enabled internal networks of knowledge employees, and no IT-enabled established Communities of Practice (CoP) such are learning networks, thematic groups, or special interest groups. Several administrators expressed the viewpoint that more needed to be done in relation to disseminating/sharing knowledge and enriching communication, especially the internal communication between members of the staff and between relating departments. On an individual or inter-group/inter-departmental level some knowledge sharing was done but the majority of the administrators were possibly "not very satisfied" with the extent to which this was happening.

The institution was doing a good job in organizing and/or holding conferences, trade shows, seminars, educational summits, training sessions, and/or panel discussions. Most of these were organized for the students, some for the faculty, and very few for the staff members.

In regards to planning and the existence of a KM strategy there was no institution-wide KM strategy and the actions of most departments/offices towards KM were ranging from well planned to ad-hoc as top administrators described them. With the exception of a couple of departments which had formal procedures which required people to cooperate and share knowledge, in the rest of the departments such procedures might be documented to some degree in procedure manuals and/or might be part of some training, or just be shared in department meetings.

The investigation for the existence of a KM-enabling culture within the institution revealed mixed viewpoints/opinions from administrators. Only about half of them answered with certainty that people are motivated and eager to learn. A culture of practicing a continuous quest for knowledge especially among all employees did not seem to be clearly characterizing the institution on its whole. A number of administrators agreed that such quest was done on a voluntary, individual basis without any directions or incentives given by management. Nevertheless, most administrators thought that the institution was promoting internal cooperation among employees for example through the establishment of committees as it also promoted external cooperation with industry consortia and other institutes for example via internships, the Industry Liaison office, the Business Advisory Council, apprenticeships, the Erasmus program for students, faculty and staff, connections with professional bodies, collaboration with government agencies and ministries, etc. There were also several collaborative research projects which run with external partners.

Below are some of the comments made by the different stakeholders during the qualitative study:

About strategy:

*"It is not part of the strategy. We are doing it but on an ad-hoc basis. It can be encouraged. Big room for improvement." (*Top Administrator H*)*

*"No strategy. Ad-hoc. We understand what it is, we know we want it but no strategy was drafted towards it with time frames and actions to be taken …" (*Top Administrator D)

*"… There is a business strategy… There is no consistent way to receive feedback from individuals regarding the implementation of the strategy. Need reflection whether the initial strategy has an effect. Lack of measurement, …" (*Top Administrator D)

*"A KO must collect all of its knowledge starting with the explicit knowledge and enable its sharing between departments and between external users." (*Staff Member)

About organizational structure:

*"At strategic level, information is shared between Senate and Council. At the operational level it is not structured and more on a day to day ad-hoc basis …" (*Top Administrator D)

*"People may not be aware of KM and its theory and how it could be structured, etc., but may be practicing it. I believe that there is reasonable exchange of information within departments. Sometimes it is more between departments that there may be a lack of knowledge sharing." (*Top Administrator I)

*"… The structure is there but there may not be enough time to plan certain things. We may not have much time to reflect and plan as much." (*Top Administrator I)

About technological infrastructure:

*"I think that documents are collected but probably are not centrally tracked and they are not broadly available and accessible." (*Top Administrator L*)*

"IT systems and support within the university is suffering. There are no systems that would allow the sharing of knowledge, sharing of documents, collaborative work, … I hope that the organization gets convinced about the need for more IT support and in particular the need for IT support for KM and that a more systematic approach is introduced relating to the introduction of IS in the organization. As a first step an MIS director could be appointed and be a member of the Executive Council so as to bring IS-related issues at this top decision-making body. All moves currently made are non-systematic and may be spasmodic but they are not recognized as such by the executive

*board and others who are not aware of what IT and IS have to offer." (*Top Administrator K)

"We have several functions running but they need to be connected so that there can be sharing." (Staff Member*)*

About culture:

*"If you provide them the means and the time people are willing to learn." (*Top Administrator E)

*"Quite a number of employees, yes. In general there is motivation… Every time we approach people with information there is response, there is readiness, …" (*Top Administrator I)

"The university culture is very positive in developing this further. Employees are eager to learn and share their experiences and expertise." (Top Administrator B*)*

"People can be trained, if there is a willingness, how to speak to each other. A culture can be cultivated." (Faculty Member A)

"We need somebody to motivate the people and cultivate the culture." (Faculty Member B)

About organizational processes:

*"…Every time we approach people with information there is response, there is readiness, but sometimes it is hindered by the fact that people may not have the time to get involved in processes that would facilitate this process. …" (*Top Administrator I)

"A knowledge organization cannot materialize if it is creating a lot of extra work on top of people's normal work. There are examples of businesses who worked on trying to avoid this e.g. by tagging peoples' work. It is essential that the technology is embedded in the work flow and not considered as extra." (Faculty Member C)

"90% of knowledge may be tacit; how can you convert this into explicit knowledge." (Staff Member)

"Currently, we have to refer to each department to sometimes get the information we need as there is no central point of access to inter-departmental data." (Staff Member)

The quantitative analysis led to the following overall conclusions:

Regarding KM practices, averages were calculated to show the KM practices in use, those not in use and the "Don't Know" replies of participants. No mean use was computed since KM usage was not rated according to a scale, like in the case of learning practices. Thus, according to these calculations KM practices' "In Use" averages ranged from 7.2 to 68.2% and only three of the twenty-two practices got an "In Use" average above 50% (see Chapter 5 Figure 27). The mean of the "In Use" averages of all KM practices was 30.2%. The mean of the "Not In Use" averages of all KM practices was 34.9%. The same (34.9%) was also the mean of the "Don't Know" averages of all KM practices. With all three averages being very close one to the other no clear conclusion regarding the overall KM perceived practices in use in the HEI can be made. Nevertheless, one could support that there was low recognition of KM practices in use in the HEI (supported by the joint percentages of "Not in Use" and "Don't Know").

After grouping the KM practices into: Policies and Strategies; Leadership; Incentives; Knowledge Capture and Acquisition; Training and Mentoring; and Communications, and observing the participants' responses one could observe that all categories were below 50% in terms of being used. Between them the category of "Knowledge Capture and Acquisition" reported the highest use – 42.4%, and Incentives the lowest – 12.3%. It might also be interesting to look at the participants' responses for "Not in Use" and "Don't Know" for the different categories. The Yes %, for acknowledging usage of the KM practice, and the No % for the no usage of the same practice were for some categories very close one to the other as was the case of the training and mentoring group of practices where the difference between Yes and No was only a 0.4% (see Chapter 5 Figure 28). In such cases, the small difference of the two groups along with the high percentage of those who replied by "Don't know" (31.0%) might be perceived as an area that required management attention not just in terms of the individual practice evaluated by also in terms of making the institutions' services more transparent to its employees. Of course, the percentage of those who replied as "Don't know" was higher than 31.0% in some other areas as was the area of leadership (44.2%), and in relation to some individual practices it reached as high as 66.2% ("The HEI has a written KM policy or strategy"). Such high percentages of ignorance on behalf of employees regarding the availability or not of specific KM practices at least suggested that the institution had not done a very good job in informing the employees about certain practices, if of course these were available. And if available, the institution had not of course enforced/used these practices to the extent that its employees would recognize them (see Chapter 5 Figure 27). The only category for which a clear answer was given was perhaps the category of Incentives for which the No percentage of 63.1% was standing out.

Observing KM practices reported by the different demographics groups did not change the picture considerably. The biggest groups (in terms of participation in the question) reported usage ranging from 26.2 to 38.3%. The conclusion drawn could therefore be that the different

demographic groups which participated in the survey reported an overall low use of KM practices in the institution.

The majority of the overall employee population perceived all of the individual KM practices and consequently all of the groups of KM practices which were formed, as important. Also, within schools all 22 practices were rated with 50.0% and above as either critical or important. Some differences existed regarding the top-rated practices both between schools as well as between other demographic groups.

The majority of the KM practices which were recognized as being used (77.2%) and the majority of the KM practices which were recognized as not being used (68.1%) were also considered important at the rate of 3.10 and above (out of 4.0). Importance of the practices used was of course positive but importance of practices not used should be an area of high concern.

Importance vs. Performance analysis (see Chapter 5 Figure 46) which was conducted revealed congruence in the section of "Keep up the Good Work" in regards to the following practices: "The HEI uses partnerships or strategic alliances to acquire knowledge" (3.32 out of 4.0) and "The HEI regularly encourages employees to participate in project teams with external experts" (3.27 out of 4.0). These were the practices which were recognized as in use while they were also considered highly important. A gap was identified in the section of "Concentrate Here" which included the following practices which were recognized as not being in use while they were also considered to be highly important: "The HEI has a value system or culture intended to promote knowledge sharing" (3.37), "In the HEI employees share knowledge / information by facilitating collaborative work by project teams that are physically separated ("virtual teams")" (3.04), and "The HEI provides informal training related to KM practices" (3.00).

According to the majority of the employees the first reason for the use of KM practices was to protect the HEI from loss of knowledge due to employees' departures and then to help integrate knowledge within the HEI.

In regards to the KM performance (results) of the HEI, with the percentages of the overall population for the scale of very effective, all being very low (below 10%) one might conclude that employees found that the HEI's overall efforts of using KM practices were not very effective. The most effective result of using knowledge management was improving worker skills and knowledge and then the increased worker efficiency and/or productivity.

The students recognized an intranet for students and a wireless network around the university as examples of KM projects available in the HEI. The top critical and important projects according to students were also recognized as being available by the majority (over 50%) of the students. A

project which was perceived as somewhat important and identified to be available by only a small percentage of students was “groupware to support collaboration”.

On average, student participants used 3.6 of the 7 knowledge management practices listed. The one with highest reported use was “The university organizes or holds conferences, trade shows, seminars, educational summits, training sessions, and/or panel discussions for students” and the one reported highest as not being used was “Students share knowledge/information by regularly updating databases of good practices, lessons learned, etc.”. In terms of importance most students thought that the most critical KM practice was “there exists within the university a continuous quest for knowledge especially among all students”.

Corrective actions

Corrective actions should be taken in the following directions:

1. The strategy of the HEI should be revisited to make necessary alterations which would provide strategic guidelines to any future KM effort. The strategy should of course be expressed in terms of specific strategic objectives which would allow its implementation and would make any future directions actionable.
2. In order that the HEI’s culture was aligned with the KM strategy it needed to be studied further. Some conclusions could already be drawn from the present study but a more detailed study might be needed. Short, medium, and long-term steps which would aim at the further development of a sharing culture should be decided and implemented.
3. The technological infrastructure had to be developed further as necessary KM components and tools were at the time unavailable starting with a staff intranet, a document management system, and enhanced communication channels. The ICT needed could be satisfied over a longer period of time by preparing a necessary plan which would be prioritizing all needs.
4. Organizational processes had to be designed or re-designed to incorporate knowledge management activities in ways that KM would be embedded in daily activities without, if possible, creating extra work for the employees.
5. KM had to be expressed in terms of specific objectives which would be paired with performance indicators so as to follow and measure the output over possibly a period of time until the HEI could enjoy the real benefits of its KM efforts.
6. Benchmarking would become desirable once the HEI reached a level of KM performance in order that it compared its practices to others and/or to suggested standards.

6.3. Drivers for Learning and Knowledge Management

The organization should acknowledge the importance of Knowledge Management and include it amongst its critical success factors. Any revisions considered necessary, should be made in the organization's strategy. Ways to reinforce a sharing culture amongst the HEI's employees should be investigated and planned. Knowledge and learning practices should be strategically planned, enabled, enforced, reviewed, and measured. ICT should be carefully selected and progressively implemented to provide the necessary functionality which would empower the employees for knowledge sharing and learning. From there on the organization should systematically provide resources, programs, and tools for knowledge sharing across the organization in support of its mission statement.

The knowledge management process would provide a means to share critical knowledge across the organization with the organization's leadership assuming an active role in encouraging and rewarding knowledge sharing. Information technology tools available to employees would facilitate the gathering and sharing of knowledge within and outside the organization and allow employees to improve their individual and organizational performance.

When the key elements of the critical success factor Knowledge Management were effectively implemented, the organization would potentially realize the following results:

6.3.1. Effectiveness Results

KM contribution to strategic performance of the HEI:

Competitive advantages *resulting from:*

- Improved and enhanced relationships with students, parents, research and other collaborators (individuals and organizations, public and private), and the community.
- Empowered decision making at all levels of management via consultation of best practices, expert advice, enhanced access to documented knowledge, enhanced collaborations and broader communication channels. Knowledge communicated to a decision maker could produce intelligence by turning findings to business results and value.
- Enhanced ability for offerings to satisfy market needs.
- Reduced program development cycle: The introduction of new programs would be possible with less effort, time and resources (mostly human).
- Reduced program maintenance efforts. The update of existing programs would require less effort, time and resources (mostly human).
- Quicker and more reliable responses to "new" requirements.
- Empowerment to investigate new research ideas to promote excellence in research.

- The introduction of standards in course delivery as well as teaching quality standardization. Relevant issues of intellectual property (copyrights) could be addressed. Goals of reaching excellence in teaching and knowledge exchange might be set at the individual as well as at the organizational level.
- The availability of enhanced online teaching and learning material to cover the needs of students, the public, and the employees of the HEI.
- Training material becoming available to employees in a variety of modes to enable them to upgrade and expand their skills.
- Enhanced ability to contribute to the society and fulfill the HEI's desire to broader its role as a HEI sensitive towards its corporate social responsibility.
- Delivering education and other services to under-represented groups as well as facilitating lifelong learning.

KM contribution to enterprise performance for the HEI:

- Increased experts' 'span of influence' in different areas for example research.
- Improved worker relationships as an outcome of the knowledge sharing culture and enhanced collaborations.
- Reduced time lost and work delays.
- Improved inter-department and intra-departmental collaborations.

KM contribution to employee performance in the HEI:

- Enhanced support offered to faculty, especially adjunct, by the availability of libraries of educational material. Duplication efforts which might involve re-creating existing materials, etc. would thus be reduced to a minimum.
- Facilitated enhanced research at the individual level and in groups via broader networks offering for communication, collaborations, and knowledge sharing such as Communities of Practice (CoP).
- Empowerment for attaining higher levels of quality by the dissemination of knowledge and practice in learning and teaching (good practices) across universities.
- Training material available in a variety of modes to enable employees to upgrade and expand their skills and thereby attain higher levels of performance.
- Facilitate ways to focus attention, search and retrieve information based on interests and needs and a way to handle the excess of available information.
- Access to repositories of corporate memories which might be recorded as best practices or offered in other forms e.g. story telling etc.
- Enhanced support for improved quality of decisions.
- Access to own and others knowledge for knowledge reuse and reapplication.

6.3.2. Compliance Result

In compliance with international standards for content and knowledge management such as the ISO standard 16171, (ISO, 2010) the organization would have developed and implemented a knowledge management strategy supported by appropriate investments in training and technology. Benchmarking its learning and KM practices might be within the long-term strategic plans of the HEI which had a history in setting high standards and achieving them. The long list of received awards served to prove the truth of this statement. Included among others are the European Foundation for Quality Management (EFQM) award, "Recognized for Excellence – 5 Stars" and the "Investors In People" (IIP) (2011) award, a world-wide recognized quality standard in the area of human resource management and development.

A number of the received awards encompassed vaguely or explicitly issues relating to learning and knowledge management. For example EFQM had released the EFQM Framework for KM which was presented in Chapter 2. Also the "Investors in People" award being a quality standard in the area of human resource management and development, was of particular interest. Thus, following the successful implementation of learning and knowledge practices to become a Learning and Knowledge Organization, the HEI might be interested to be evaluated through specialized KM benchmarks to receive the equivalent award(s).

6.4. Implications of Research Findings for the HEI

The above research findings call for a number of actions which may be prioritized and executed according to a plan which will schedule them for short-, medium- and long-term execution.

6.4.1. Short-Term Actions Needed

1. *The technological infrastructure had to be developed further as necessary KM components and tools were currently unavailable starting with a staff intranet, a document management system, and enhanced communication channels. The ICT needed could be satisfied over a longer period of time by preparing a necessary plan which would be prioritizing all needs.*

   As the HEI was currently in the process of developing a new version of the faculty intranet it was of utmost importance that this upgrade of the intranet was reviewed in order that KM functionality or provisions for such functionality were made to the extent that was currently possible. It was well understood that no spasmodic moves should be made as the risk of stepping into KM with the wrong foot, meaning to say that if the first attempts to using KM were unsuccessful, this might create a very negative impression that would stand in the way of future implementations.

The new version of the faculty intranet would be used as a prototype for the creation of the staff intranet which was planned to follow in implementation right after the faculty intranet was released for use. This was of course another reason why the new design should be carefully studied for the inclusion of learning and KM practices.

As a first step emphasis should be given to enabling those activities which the survey study revealed as being pressing. These included the development of a central document (and more) repository via a document management system which might expand in the future to a content management system or a content management system which might start with the management of documents (better and more flexible solution) and the establishment of communication channels enabling intra-department and inter-department communication and collaboration. This second part could very well be served via the development of Communities of Practice (see Chapter 2).

2. *Organizational processes had to be designed or re-designed to incorporate knowledge management activities in ways that KM would be embedded in daily activities without, if possible, creating extra work for the employees.*

   The provision for IT features, those proposed in point 1 above and the rest that would follow, needed to be worked out to be serving well and be in full alignment with the underpinning processes which those features would serve. Technology should, to the extent possible, be pervasive and ubiquitous while at the same time it should be discreet, seamless, and transparent, thus, enabling and empowering without imposing extra effort. This should be seen as an on-going activity in the same way that additional IT was introduced.

3. *In order that the HEI's culture was aligned with the KM strategy it needed to be studied further. Some conclusions could already be drawn from the present study but a more detailed study might be necessary. Short, medium, and long-term steps which would aim at the further development of a sharing culture should be decided and implemented.*

   As a first step leadership should step out and openly promote and actively support the KM initiative. Certain actions which might encourage employee participation and active knowledge sharing such as considering the offering of specific incentives (extrinsic motivation e.g. monetary and non-monetary rewards and intrinsic motivation e.g. enjoyment of helping, self-efficacy, etc.) should be in the immediate plans of the HEI acknowledging that incentives and leadership-related KM practices ranked very low in the survey study which was conducted.

6.4.2. Medium-Term Actions Needed

1. *The strategy of the HEI should be revisited to make necessary alterations which would provide strategic guidelines to any future KM effort. The strategy should of course be expressed in terms of specific strategic objectives which would allow its implementation and would make any future directions actionable.*

   The last revisions of the HEI's strategy were done as part of a five-year Corporate Plan for the years 2010-11 to 2014-15. The scheduled release of a new five-year Corporate Plan for the years 2015-16 to 2019-20 presented the perfect timing for the inclusion of learning and KM in all of the necessary sections of the corporate plan. For this purpose the current Corporate Plan had been studied and the relevant sections had been highlighted (Appendix D). The HEI's Mission statement and the Summary Statement of Values covered either directly or indirectly both learning and KM; thus, no change was deemed necessary at this level. The specific core values which address KM were:

   - Cultivating, promoting, transmitting and exchanging knowledge and safeguarding academic freedoms (Core value 2);
   - Efficient and sustainable use of resources (Core value 8); and
   - Promoting entrepreneurship and innovation (Core value 10).

   All eight strategic pillars of the HEI involved to some extent KM in their strategic objectives (Appendix D – See highlighted sections). If the HEI so wished to emphasize KM, a new strategy pillar could be added, with dedicated objectives which would direct actions toward the implementation of KM within the institution. Organizational learning could also be addressed within this pillar. Alternatively, additional objectives could be inserted in the existing strategic pillars to emphasize learning and KM practices.

2. *An ICT strategy should be developed in accordance with the business strategy to shed the way for all ICT developments and to structure the needs so as to develop an action plan for their implementation.*

   At the time there was no written ICT strategy that was followed at the HEI. An old draft (2002) (Appendix E) outlining such a strategy was retrieved and studied. The draft was suggesting more work towards developing an ICT strategy. For this purpose specific suggestions were made for the formation of an IT Strategy Committee (ITSC), the appointment of an Executive MIS Director, and the restructuring of the existing MIS Centre.

   I also investigated the ICT strategies of a number of HEIs some of which were explicitly documented and openly available. Some examples include:

- The ICT Strategic Plan, 2005-06 to 2009-10 of the University of Oxford (University of Oxford, 2005);
- The IT strategy from the University of Liverpool (University of Liverpool, 2013);
- The UCLA IT Strategic Plan 2009-18 (University of California, Los Angeles, 2009);
- The Bournemouth University Information Systems Strategy 2006-10 (University of Bournemouth, 2006);
- The University of Bristol, Information Technology Strategy (University of Bristol, 2008).

3. *A Knowledge strategy might be written to bring together all aspects of the business strategy and all related components of the ICT strategy and combine them with the remaining necessary enabling ingredients of KM.*

   Such knowledge strategies or related information strategies were available at some HEIs such are the examples of:

   - The Liverpool Hope University Information Strategy 2007-2011 (Liverpool Hope University, 2007); and
   - The University of Liverpool Information Strategy (University of Liverpool, 2013).

4. *A Learning and Teaching strategy might also be written to include all dedicated efforts of the HEI to excel in offering top level quality teaching and learning primarily to its students but also its staff and faculty and the broader community.*

   The HEI should be praised for its recent development of the University of Nicosia Teaching and Learning Institute (UNTLI) which was created to support faculty in teaching by offering training and other services.

   It was in fact one of the recommendations of the European Union's High Level Group on the Modernization of Higher Education that all HEIs should develop and implement a strategy for the support and on-going improvement of the quality of teaching and learning. In such strategy the HEI should be taking the necessary actions towards the devotion of human and financial resources. All initiatives should be seen as a priority integrated in the overall mission of the HEI, thereby giving teaching and learning due parity with research (EU High Level Group on the Modernization of Higher Education, 2013) .

   Certain countries have already taken initiatives at the state level to create central authorities to serve as centres of excellence developing new knowledge for teaching, learning, and research in teacher education. Such a centre is Norway's Centre for Excellence in Education (University of Oslo, 2013).

Such learning strategies were available at some HEIs such are the examples of:

- The University of Surrey, Learning and Teaching Strategy 2010-17 (University of Surrey, 2010);
- A more recent Technology Enhanced Learning Strategy 2013-17 of the same university (University of Surrey, 2013);
- The University of Liverpool Hope, Learning, Teaching and Enhancement Strategy (2013-16) (Liverpool Hope University, 2013) and an associated Learning and Teaching Staff development Plan;
- The Birkbeck University of London Learning the Teaching Strategy 2009-12 (Birkbeck University of London, 2009).

5. *Further ICT developments aligned with the organizational processes which were designed to enable KM should continue to be planned and implemented.*
6. *As KM had been formulated in the KM strategy in terms of specific objectives these objectives should be paired with performance indicators and regular measurement activities should be implemented and undertaken.*

6.4.3. Long-Term Actions Needed

1. *Benchmarking would become desirable once the HEI reached a level of KM performance in order that it compared its practices to others and/or to suggested standards.*

   An appropriate standard could be selected and KM as was the case of other business practices could be benchmarked against the selected standard.

2. *All KM and learning enablers should be regularly revisited to ensure their enabling nature. KM enablers include: the organizational structure, strategy and leadership, technological infrastructure, culture, organizational processes, and the need for measurement which would serve as the necessary act for feedback.*
3. *Once a high level of KM performance was reached and in accordance with its strategic pillars, the HEI could look outwards into ways to share its knowledge with the community. An example of best practice in this direction was the creation of Knowledge Transfer Partnerships (KTP) between the industry and academia* (HEFCE, 2009). *Another example was the creation of national education centres, such as the Higher Education Academy in UK, which support the individual centres' efforts and facilitate the sharing of good practice via established networks* (HEFCE, 2009).

   Efforts such as the above promoted the role of the HEI within the local and the global community and formed tangible ways in materializing a role for Cyprus as a regional, European, and international knowledge centre.

6.5. Conclusion

This chapter addressed all areas and issues requiring attention in a KM study. The conclusions reached from the analysis of the results obtained from the survey contacted in the HEI, led to a reflection and that to a recommendation I made for specific corrective actions. An action plan organizing suggested actions into short-, medium-, and long-term actions was devised. The chapter was completed with a summary of the work completed so far and an evaluation of the accomplished research objectives.

Chapters 5 and 6 together presented the activities of the conducted exploratory study. These followed the research plan decided in Chapter 4 (see section 4.5). The data collected from the qualitative and quantitative surveys along with other hard data were analyzed and the first three research objectives (see sections 1.3 and 5.2) were satisfied.

Chapter 7 presents a case study on a KM implementation in the HEI which may be used as a best practice and may serve as a description of a KM implementation framework for future KM implementations in the HE sector.

Introducing Chapter 7

The design of a complete organization-wide implementation of KM in the HEI was not possible at this stage. The reason was that according to the findings of the study which were supported by the survey results offered in Chapter 5, the overall recognition of KM practices in use at the HEI was low. Inefficiencies were identified in all areas of KM implementation including the capturing of knowledge, especially tacit knowledge, the organization of knowledge in ways that enabled the easy access, as well as in the dissemination of knowledge. Inadequacies were also identified in relation to a KM strategy, a KM-enabling culture, incentives and motivation for knowledge sharing given to employees, as well as the availability of the necessary ICT to support both the activities of learning and KM.

Considering the importance of all of the components of KM and the fact that all enablers had to be planned and implemented for the KM initiative to be effective it was not possible to promote one component, i.e. the technological infrastructure, before all aspects were studied carefully and considered as equally important.

Therefore, the last objective covered by activity 6 of the cycle which concerned the introduction of a specific kick-off KM implementation in the HEI needed to be formulated in such a way that could serve as a guideline for other future KM implementations. Thus, Chapter 7 presents the detailed approach followed in introducing KM in the HEI. The chapter was written as a stand-alone presentation of the specific KM implementation as it is intended to be replicated and customized as necessary by the HEI for its future KM implementation efforts. At the same time the case study offers for use by other HEIs and organizations wishing to implement KM. The title of the chapter: “Knowledge Management in a Higher Education Institution: A Case Study”.

[7]

The Case Study

This chapter presents a KM use-case with the title “Knowledge Management in a Higher Education Institution: A Case Study”, which materializes findings of the previous chapters.

"Knowledge has to be improved, challenged, and increased constantly, or it vanishes." -- Peter Drucker

CHAPTER 7: THE CASE STUDY

7.1. Introduction

This chapter presents a case study on a KM project implementation in the HEI which may evolve with additional KM implementations into an organization-wide KMS for a HEI.

7.2. A KM Implementation in a HEI

Knowledge Management in a Higher Education Institution: A Case Study

Glossary of Terms

BI – Business Intelligence

CM – Content Management

CMS – Content Management System

HE – Higher Education

HEI – Higher Education Institution

ICT – Information and Communication Technology

KM – Knowledge Management

KMS – Knowledge Management System

KSC – Knowledge Steering Committee

UNic – The University of Nicosia

Background

The University of Nicosia (UNic), located in Nicosia, Cyprus, is an independent, co-educational, equal opportunity tertiary education institution, which has become a global education centre committed to maintaining its position at the forefront of education, research and social service, in line with the enduring motto of the institution: “Excellence in Education”.

The institution began operations as Intercollege in 1980 and in 2007, following changes in the relevant local legislation and a comprehensive accreditation process, the University of Nicosia emerged. Today, the University of Nicosia is the leading independent university in Cyprus. Through its four schools, the University offers a diverse range of academic programs of study, at both the undergraduate and postgraduate levels (Bachelor, Master and PhD degrees). Since

2011, the University of Nicosia operates a Medical program, in collaboration with St. George's, University of London, one of the leading medical schools in the UK.

Along the way, the institution has earned prestigious awards, such as the United Nations "Global 500" award, for its contribution in the protection and improvement of the environment and the establishment of the first UNESCO Chair in Cyprus, for the promotion of cultural diversity and intercultural dialogue. More recently, the University of Nicosia has become the first and only University in Cyprus and Greece to reach the EFQM recognition level "Recognized for Excellence - 5 Stars" which is one of the most prestigious awards for organizational excellence and is given to Europe's best performing companies.

Knowledge Management Initiation

UNic's first action involved the establishment of a Knowledge Steering Committee (KSC) consisting of a Knowledge Officer/Advisor, the Executive Vice President for Administration, and the Head of the Computer Centre responsible for ICT infrastructure. The KSC consulted with the newly established University of Nicosia Teaching and Learning Institute (UNTLI) by inviting its Director to participate in meetings involving employee training issues. Other associates and matter experts were called in when their advice was needed.

A simple development methodology calling for five phases (Figure 60) was utilized.

Figure 60. The methodology used for the KM Implementation

KM efforts addressed all the major elements for a successful KM implementation and thus involved the people, the processes, and the technology. Stankosky's KM model (Stankosky, 2005) and the four pillars of the KM environment being, leadership, organization, technology, and learning were all principle areas of concern. An expanded list of KM enablers was considered. The list included: Organizational Structure; Strategy and Leadership; Technological Infrastructure; Culture; Organizational Processes; and Measurement.

The KSC directed its efforts towards the development of a holistic KM environment to include the strategy, processes, infrastructure, and culture.

Phase One: Assessing the Need

Motivated to reach excellence in all aspects of its operations UNic's management recognizes the absolute necessity to continuously seek improvements in its current practices. UNic's

management and staff came to realize the need for knowledge management (KM) and the value of better leveraging the organization's knowledge. Since its establishment in 1980 the organization grew enormously and its expansion is still taking it into new areas of operations being new program offerings in conventional and new modes of delivery at both the undergraduate as well as the postgraduate level, new collaborations with local and international alliances, additional services offered to the students and the broader community, and more. The organization had an urgent need for a system which would allow it to leverage its vast unexploited wealth of experiences, educational know-how, best practices and other intellectual capital. Top management saw the opportunity to use KM to improve their current practices and some of the top executives articulated their viewpoints as: "*KM practice should be considered a critical success factor*", or "*KM is something that I believe it is of paramount importance*". Yet another top administrator said:

> "*I am still not sure if I fully understand the concept of KM. If it only involves the sharing of knowledge then that is something we do all the time. I am assuming there is something else behind it as well. I like this idea about a portal that will collect everything; I believe it will be very useful; we do not have it and it would be very important to proceed with such a portal's creation. … Most of the things are documented but we could become a lot better."*

Accordingly, UNic initiated an internal study and gave responsibility to one of its faculties to carry on research as part of a doctorate study in order to advise the institution regarding the implementation of KM which would allow it to harvest the desirable benefits of KM.

The first step was to perform a thorough investigation of the current practices of the organization to establish the extent to which the stakeholders (faculty and staff, administrators, students) recognized any KM practices currently in use. The study also addressed issues of learning as it was necessary to determine the organization's learning practices and readiness. The study showed that the stakeholders could only recognize a small percentage (30.2%) of KM practices as being used while they considered all of the investigated practices as being important. The organization's readiness for learning was established to be good as, according to the same survey, 83.8% of the learning practices were recognized as being used. The study revealed important insights regarding the organization's current operations as it showed that the different KM enablers needed to be enhanced and re-designed some more and some less.

The results of the study were reported back to the organization's leadership with specific suggestions regarding future actions which needed to be planned for the short-, medium- and long-term and some that should be on-going and continuing. These suggestions involved creating a KM-positive environment and addressed issues relating to the organization's structure and

leadership, strategy, technological infrastructure, culture, organizational processes, as well as performance measurement and benchmarking. Unless, all of the above (except benchmarking) were carefully planned the organization would run the risk of them becoming barriers instead of enablers in its KM efforts.

It was obvious from the outcome of the study that KM would not only establish new avenues of communication within and between departments, schools, the whole organization and its students and other stakeholders, but it would also help all stakeholders to become more productive by allowing them to share specific (focused) and general knowledge, learn from others' practices (successes and mistakes), as well as capture reusable material.

It was possible to define the drivers of the need for knowledge management and organizational learning in the context of some of the strategic pillars of the HEI which are shown below:

- Enhance high quality teaching and learning;
- Promote research, knowledge transfer, innovation and scholarship;
- Widen fair and inclusive access and participation;
- Enhance efficiency and effectiveness;
- Promote a culture of collegiality.

The study also revealed some aspects of KM implementation as most pressing and it was therefore agreed with management to proceed with the steps necessary to implement these aspects while of course all the other recommendations would be planned for and initiated. Thus, the initial KM efforts focused on delivering:

1. **Enhanced communication and collaboration tools between internal stakeholders**. Following the suggestions of all of the stakeholders this was considered as top priority. In particular, administrators said that immediate efforts should be directed to establishing communication and collaboration channels especially between employee members of the organization. The unavailability of a staff intranet was especially noted. As it was characteristically put by a member of the staff: *"When you are small, communication is easy and simple but with our current size of about 400 employees, communication cannot just take place via meetings, phone and emails. We have been scheduling a staff intranet for four years but it has not yet started."*
2. **A content management system.** The necessity for such a system was addressed by both the administrators and the staff of the HEI. Administrators raised their concern about the absence of a central repository and clear directions and responsibilities assigned to a specific office/officer for its maintenance. Similarly, a staff member described the current state of affairs by saying that, *"Currently, we have to refer to each department to get the information we need as there is no central point of access to inter-departmental data."*

Yet another member of the staff said: *"A document management system is necessary because even if things are recorded and some are, the document form in which they exist is not searchable and not easily traceable."*

Needs' satisfaction ought to be paired with the addressing of some challenges immediately. These involved:

- Culture-related issues:
    - Faculty sharing: Knowledge is what defines an academician and this is not just the knowledge which one has acquired over years of education and years of teaching experience but is equally the knowledge that an academician generates through his/her research activities. Thus, it is understandable why academicians may be knowledge hoarders who need to be converted into knowledge sharers. This by itself was a big challenge. Possible intellectual property issues standing in the way of faculty sharing their knowledge with other faculty also needed to be addressed.
    - Staff sharing: The un-clear delegation of duties and some overlapping of responsibilities which are created over years of operation are many times the reasons for stress in inter-personal communication.
    - Department-to-department sharing: The conflicting goals of an organization's departments may be sometimes influencing people's behaviours.

  As one faculty member put it: *"We need somebody to motivate the people and cultivate the culture."*

- Lecturer autonomy: Some universities worldwide may be characterized by a centralization of the knowledge they deliver in having all of their courses' content created by an area expert, while some others prefer to maintain autonomy in course delivery by allowing each faculty to materialize his/her taught course with the only prerequisite being the coverage of a pre-decided syllabus. Even though UNic overall belongs in the second group, as an organization it could enjoy considerable benefits by the collection of course knowledge which may be re-used in cases of part-time teaching as well as in the introduction of new courses and programs. Such practices may also be desirable for reasons of uniformity and standardization, to the desired extent, as components of quality.

The first two KM milestones were expected to deliver effectiveness and efficiency in the form of:

- ✓ Empowered decision making at all levels of management and in general empowered employee activities via consultation of best practices, expert advice, enhanced access to documented knowledge, enhanced collaborations, and broader communication channels.

- ✓ Enhanced ability for offerings to satisfy market needs combined with a reduced program development cycle and reduced program maintenance efforts.
- ✓ Facilitated enhanced research at the individual level and in groups via broader networks offering for communication, collaborations, and knowledge sharing.
- ✓ The introduction of standards in course delivery as well as teaching quality standardization.
- ✓ Enhanced employee support and the opportunity to upgrade and expand one's skills using available training material offered in a variety of modes.
- ✓ Improved worker relationships as well as inter-departmental and intra-departmental collaborations as an outcome of the knowledge sharing culture and enhanced collaborations.
- ✓ Timely access to knowledge, and hands-on knowledge gained through experience.

These expectations for effectiveness and efficiency needed to be closely followed by the necessary knowledge program assessment which involved the following measures:

1. Accessibility of UNic's employees to KM resources and to colleagues (Penetration measurement).
2. Rate of contribution of knowledge to UNic's repositories.
3. Rate of use of knowledge available in UNic's repositories.
4. Quantity and quality of contents of UNic's knowledge repositories (Annual Employee Survey).
5. The extent to which employees believe their leaders have developed a culture that values and rewards knowledge and promotes knowledge sharing and personal growth (Annual Employee Survey).

Phase Two: Planning & Strategy

One of the first tasks of the KSC was to develop training, communication and internal marketing programs to establish knowledge management understanding, acceptability, enthusiasm and desire amongst UNic's employee force. One of the approaches used was to create case scenarios that would exemplify the intended KM functionality and benefits. One such scenario involved the functioning of the Senate, the highest academic university body responsible for creating new university policy. Another approach involved the initiation of a storytelling program through which the speaker employee presented a personal story about his/her experience with KM.

The KSC also considered organizing workshops intended to train employees on KM and its implication on behaviours, values and work practices using experiential learning and other forms of training. The workshops were planned for organization after KM development so as to combine training on the new delivery approach and tools.

The KSC also recognized the need to re-engineer much of the existing knowledge resources. In doing this it had to acknowledge the challenge of balancing innovation, both in ICT infrastructure and process re-engineering, with the leverage and reuse of existing knowledge and experience. It was important to recognize the technological infrastructure as an enabler and not a driver and to embed it in the business processes in natural ways which would not burden employees with additional work. In fact, technology should not only be designed to follow the natural way of doing things but also the sharing of knowledge should be tightly integrated into the work practices of the organization so that it would become part of daily work, and not perceived as being separate from it. Thus, the KM effort started with the definition of the desired results, to then identify the required actions in terms of process re-engineering or other, to move on to decisions to achieve those results. In the route all involved knowledge was identified and prioritized and finally all necessary technological developments were carefully designed and delivered.

A KM Implementation for UNic's Senate

At the start, the KSC recognized that the KM effort needed to be evolutionary and decided about one area of UNic's operations to focus on. The successful implementation of this first-of-a-series, as it should be seen, KM prototype would then be used as the showcase for the forthcoming KM projects. The goal of the "KM Implementation for UNic's Senate" project was to demonstrate the effectiveness of knowledge management initially to the end-users of the system and then the whole organization.

The criteria set for the selection of the first KM implementation were calling for:

a) a group that was highly visible and whose work was of strategic importance to UNic;
b) a high level of readiness resulting from having a need for sharing and leveraging knowledge; and
c) a leader who would commit to the success of the implementation.

Based on these criteria, the KSC selected the Senate of UNic for the first KM implementation. The specific system would not require any regulation of culture-related issues and the lecturer autonomy would not present a problem. This is mostly because the knowledge, both the explicit and the implicit knowledge, involved with the Senate operations is not of personal nature, i.e., it cannot be considered personal intellectual property, and as such it does not raise issues relating to sharing. The challenges involved with the specific project involved training, change management and process redesign and these became the areas of concentration.

The Senate

The Senate is the highest academic university body and is responsible for all work relating to teaching, research, and other academic activities. Explicitly the main responsibilities of the Senate are:

- Determines the general educational and research policy of the University;
- Determines the academic programs and levels as well as the method of admission of students to the University;
- Determines the admission requirements to the University's programs, the grading system, the promotion requirements for students, and the conditions for the award of Degrees and Diplomas;
- Recommends to the Council the creation or abolition of Schools or Departments;
- Defines the process of selection and promotion of faculty members. It is understood that the Council approves academic appointments and promotions proposed by the Senate;
- Recommends to the Council the development of the infrastructure of the University;
- Promotes the relations of the University with other educational institutions and organizations locally and internationally;
- Recommends to the Council the award of honorary degrees and other academic distinctions;
- Defines the academic policies of the University Library and Information Services; and
- Issues, in co-operation with the Council, Internal Regulations.

The Senate members are the Rector, the Vice Rector(s), the Deans of all schools, the Vice President for Administration, two elected Teaching Research Faculty (TRF) representatives from each school, one elected Special Teaching Faculty (STF) representative from each school, and one elected student representative from each school. The Senate is chaired by the Rector and in case of absence by the Senior Vice Rector. The body develops its own By-Laws that must also be approved by the University Council. It may constitute committees from among its members and delegate to them authority on different issues. It also exercises disciplinary control over students and faculty.

The Senate body was currently communicating, prior and post its meetings, entirely via emails with the different documents being forwarded to Senate members via attachments. Regular meetings were scheduled once a month and some extra meetings were scheduled as needed. Lately, all decisions of the Senate were publicized to all members of UNic again via email attachments. All of the administrative work was managed by the Rector's Secretary.

Identifying the Knowledge

The project began by identifying the knowledge that needed to be shared and as a result a knowledge map (Figure 61) was created. The map revealed important tacit and explicit knowledge and its sources.

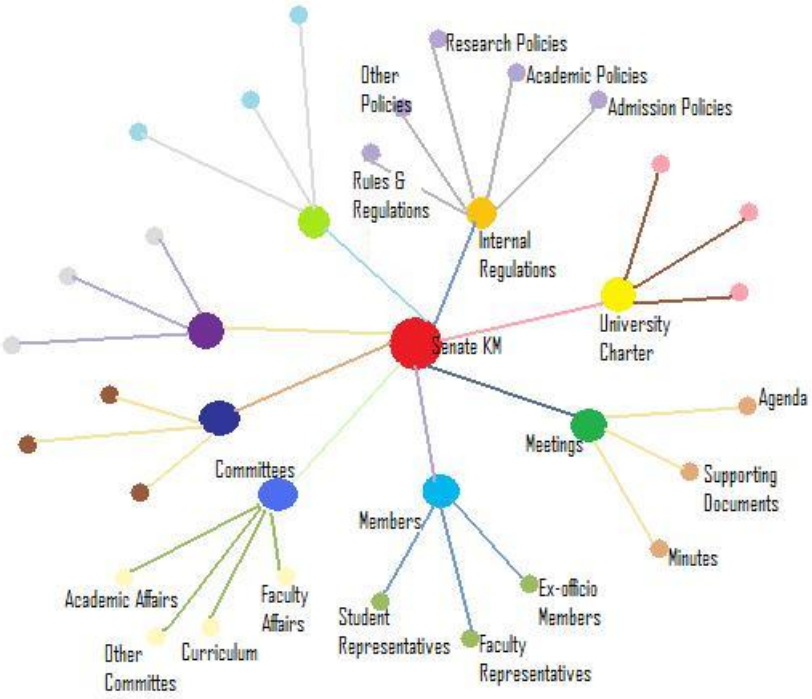


Figure 61. A Partially Completed Knowledge Map for the Senate

Identifying the Processes

Following the identification of the knowledge to be shared, the KSC devoted time to the re-engineering of the involved processes which concerned the following functions:

- The formation of the Senate: The term of office of the elected or appointed members of the Senate is two years for the faculty member representatives and one year for the student representatives. Once the term of office of members has expired or a member has resigned his/her position, and when new members are elected the Secretary of the Rector performs the necessary updates in the Senate Consortium list.
- The formation of Committees: Senate members volunteer for participation in the different committees formed to initially review different focused issues of their jurisdiction and prepare a proposal for the Senate assembly meetings. The Secretary of the Rector creates and updates the committees with their members as necessary.
- Preparation of a Senate meeting: Senate members propose topics for discussion during the Senate meeting. Topics are supported by one or more supporting documents. An ad-hoc agenda committee reviews the topics and decides on further action which involves: (a) directing a topic to a Senate committee for initial processing; or (b) writing a topic for

presentation in the agenda of the next meeting; or (c) declining the presentation of a topic in front of the Senate either because it concerns a topic which may be out of the jurisdiction of the Senate or because it may not be supported by the necessary documentation.

- Call a Senate meeting: The Rector calls for the next Senate meeting and the Secretary of the Rector informs all of the members by sending them the agenda of the meeting and all the supporting documents.
- Hold a Senate meeting: During the meeting the minutes of the previous meeting are approved, new agenda items are discussed, documents are reviewed, and decisions are taken. All work is followed carefully and records are updated.
- Prepare a Senate meeting's minutes: Minutes are prepared documenting all Senate decisions and actions. These are at first circulated to all Senate members and upon approval to all of the employees of UNic.
- Update and distribute all documents: All knowledge is documented and then publicized and made available to authorized users and groups or the broader public community.

Designing the Technological Infrastructure

The first decision regarding the technological infrastructure involved the use of a Content Management System (CMS) which would mostly work in the case of the Senate as a Document Management System that would support the collection, organization, update, storage, and dissemination of all of the documents and possibly other content that is handled by the Senate.

Most of the content that is managed by businesses is published through some website, either an intranet or an extranet, thus, many CMS are at the same time Web CMS (WCMS) which mostly support dynamic database-backed websites. Further to this categorization some CMS are described as Enterprise CMS (ECMS) and some are described as Group CMS (GCMS) due to the additional functionality which they offer. Nevertheless, a specific CMS may combine the characteristics of all three categories. Both open-source and proprietary CMSs are widely used.

Beyond the offered functionality other decisive factors for the selection of a suitable CMS included:

- The availability and capability of technical skills at the organization.
- The existing technologies or languages the IT team was familiar with. The organization's preferred framework of development which mostly involved Microsoft products, Oracle databases, and the .NET development environment.
- The system that the CMS would integrate with.
- The budget available. Costs included an upfront license cost (only for proprietary commercial software) as well as implementation, enhancement and support costs.

- Ease of use, especially for non-technical content authors who would be required to enter/update content.

Several published reviews for CMSs were considered with some of these systems being freely available (open-source) and some other being proprietary software (see Appendix F and Appendix A). A number of CMSs were reviewed with hands-on experience. These included Joomla and WordPress, the top two in popularity open-source CMS. Some others were only reviewed through web available information centres, product reviews, and customer-reported hands-on experience available in published case studies. The whole process of evaluation that led to a shortlist of two software systems and finally the adoption of MS SharePoint as the selected software platform for the KM implementation is explained in Appendix F.

MS SharePoint, the selected software platform, combined the communication and collaboration tools which were highly desirable with the content management capabilities which were urgently needed.

Developing a Knowledge Culture

The efforts made towards creating a knowledge culture within the Senate involved the creation of training, communication and internal marketing programs to establish knowledge management understanding, acceptability, enthusiasm and desire amongst the Senate members. Workshops were organized to train employees on KM and its implication on behaviours, values and work practices while also offering training on the new delivery approach and tools.

Measurements, and reward mechanisms were also designed to complement the above efforts.

Phase Three: Implementation

The implementation of the KM Senate project involved the creation of the following functionality:

1. An application component to handle member and committee management and other administrative tasks such as meetings' organization, attendance, and minutes.
2. A document management component to follow the creation, updates (versioning), status, organization, and distribution of documents amongst Senate members and others.
3. A communication environment which materialized in the form of a Community of Practice to involve the members of the Senate into an engaging, enabling, and productive communication.
4. A collaboration environment allowing the members of the Senate to collaborate on the development and sharing of documents from their conception until their finalization followed by a Senate approval. Templates were designed to standardize the documents' format.

All this functionality was blended and delivered via a common environment, a Senate intranet, and was embedded in the involved processes. The selected software platform, being MS SharePoint, combined the communication and collaboration tools with the content management capabilities needed. The application component described in point 1 above was additionally created and offered through the same platform.

KM efforts materialized through:

A. The implementation and integration of the intended knowledge processes.
B. The creation of organizational capability by developing skills, embedding knowledge management into the evaluation system, and providing rewards and recognition for best practices which involved knowledge sharing and reuse.
C. The implementation of a repository for the storage and availability of explicit documented knowledge.
D. The ongoing development of new KM products and the incorporation of these products in existing and new work practices.
E. The development of a support centre (in collaboration with University of Nicosia Teaching and Learning Institute - UNTLI) to coordinate and develop a Learning Community by supporting:
    a. flexible training options, including online training with demonstration videos;
    b. a forum, used to connect end-users with other end-users and the support centre for online support and exchange of know-how;
    c. a wiki page, to keep track of KM practices and provide examples of best practices, case scenarios exemplifying KM functionality, personal stories describing user experiences with KM, etc.; and
    d. workshops, offering training on KM including training on KM tools, teamwork, trust, reflections and a story telling practice, all focusing on strengthening the values, behaviours, and work practices necessary for the KM environment to develop and flourish.

Phase Four: Reinforcement

The above steps were followed not only in relation to the kick-off Senate project but also as the designated approach for all of the KM efforts which followed. It was expected that as KM would expand new organization-wide KM-related roles would need to be created so that efforts would become focused and intensified towards the achievement of specific goals. As content would grow, it was also expected that the need to structure it, so that it could be easily searched, would also grow. Thus, the underlying technology would need to be simple and flexible to allow

modifications and additions so as to empower employees for the easy sharing and retrieval of knowledge.

Reinforcement involved motivating, encouraging, and rewarding individuals for their KM activities. Reflection was integrated into processes in many ways. The story-telling program was used to bring out people's personal experiences. The wiki page was recording these experiences and other best practices. A selection of stories and best practices was published in different publications of the HEI. Motivated individuals undertook the role of mentors for newcomers being new members of a committee or new hires in a department with the responsibility of taking them through an initiation process and acclimatizing them with KM.

Other forms of recognition and rewarding towards individuals who were exhibiting the desired behaviours of sharing and reuse were developed.

Phase Five: Evaluation

The expectations for effectiveness and efficiency which defined the measures for KM assessment in Phase One also served as the evaluation criteria. These were:

1. Accessibility of UNic's employees to KM resources and to colleagues (Penetration measurement).
2. Rate of contribution of knowledge to UNic's repositories (number of new items added).
3. Rate of use and re-use of knowledge available in UNic's repositories (number of accesses per day).
4. Quantity and quality of contents of UNic's knowledge repositories (Annual Employee Survey).
5. The extent to which employees believe their leaders have developed a culture that values and rewards knowledge and promotes knowledge sharing and personal growth (Annual Employee Survey).

Ways to bundle KM achievement both in personal and group performance evaluations were considered. The idea to motivate, hire, reward and promote people both on their individual performance as well as their performance in a group being a department, school, committee, or other, was under investigation.

Evaluation was not yet completed at the time of writing up this case study. Thus, no performance changes could be reported. One thing was certain and that was the enthusiasm by which the Senate KM project was received by all members of the Senate.

Leadership guidance, support and modeling of desired behaviours would continue to be perceived as a must for any future KM effort. The same goes for the desire to seek for and invest into continuous improvements to processes, tools and capabilities.

Success in obtaining the desired KM results depends on stimulating the organization towards achieving the desired behaviours through committed leadership, knowledge processes, easy access to knowledge, and an open and trusting environment.

7.3. Conclusion

In this chapter I presented a case study on a kick-off KM project implementation in the HEI which could evolve with additional KM implementations into an organization-wide KMS for a HEI. The purpose of the case study was to serve as a guide for the future efforts for the implementation of knowledge management practices in the HEI under study and possibly other institutions with similar characteristics and needs in the HE or other sectors.

Section IV

Self-Reflections

Chapter 8 – Self-Reflection on DPS Level 5 Descriptors and Learning Outcomes

[8]

Self-Reflection on DPS Level 5 Descriptors and Learning Outcomes

This chapter reflects on my achievements throughout the research journey.

"To know is to know that you know nothing. That is the meaning of true knowledge." -- Socrates

CHAPTER 8: SELF-REFLECTION ON DPS LEVEL 5 DESCRIPTORS AND LEARNING OUTCOMES

8.1. Introduction

In this chapter I reflect on the achievements of the study and recall back the research journey from start to end describing the accomplishments made and the overall experience with a critical mind. My spirit as it comes out from this chapter is both impatient to complete the study and nostalgic.

8.2. My Reflections

The aim of this chapter is to reflect on the research journey and efforts made as part of this doctorate study. In particular, the chapter includes self-reflections on the impact of this research on my personal and professional development and provides evidence of achievement throughout the research study in line with the descriptors and learning outcomes of Level 5 of DProf projects.

My initial motivation for taking up this research study on "Knowledge Management in Education" was a general comment shared by many employees with several years of experience in the employer HEI, both faculties and administrative staff. These people when referring to how things were several years ago and how things are now in the institution they say:

> *"It was different back then; we all knew each other and worked together as a team. Now, everyone is isolated. We do not anymore know what each one is doing."*

Additionally a number of deficiencies in different areas of the HEI's operation which I could observe as an insider-researcher and which were prohibiting the institution from reaching a higher level of efficiency could in part be attributed to lack of or insufficient utilization of modern ICTs.

In my 22 years of employment as a faculty member and some more years before then as a student and staff member of the specific HEI, I have witnessed a lot of changes that this institution has undergone. The changes have been significant and necessary for the expansion of the institution from a very small college to the largest private university in Cyprus. In the way employee numbers for staff and faculty members have been increasing, employee relations were bound to change. Maintaining a work environment characterized by good and close work relations, with employees actively engaged in collaborations and the sharing of knowledge, with each one benefiting from the work and knowledge of others and from collaborating and working with others, and the organization benefiting from all of these aspects together is not at all easy.

It was obvious to me as a computer scientist and an MIS consultant that information and communication technologies (ICT) could definitely enable the institution to achieve a higher level of efficiency in many areas of operation.

I chose to examine how KM could be utilized to build an environment in which employee relations would tighten up, cooperation and collaboration would be enabled and enhanced and one's knowledge would ultimately become common knowledge. If all these could be realized then knowledge would potentially leverage into a major corporate asset which, if utilized efficiently, could form a competitive advantage for the HEI.

My conscious choice of the Doctorate in Professional Studies versus a Doctorate of Philosophy, offered me the perfect environment of study for the exploitation and utilization of KM to the benefit of the HEI in which I am employed. My background, both the educational in Computer Science and Management of Information Systems and professional (consulting and software engineering) experience, served the requirements of such a study in an excellent way providing both the technological expertise, the business know-how, and the experience in servicing the education sector, all necessary for a successful blend of technology, management, organizational behaviour, and other related components of a KM environment with best understanding of the particularities of the educational service sector. The significant opportunities for organizations (including academic institutions) to apply KM practices to support their mission, made the particular doctorate study very appealing to the HEI's executive management which welcomed it with particular interest.

The project was therefore falling directly within my MIS specialization and my current research interests. As it proved, with the completion of the project, having undertaken this study has allowed me to develop new knowledge and expertise in the area of KM and broadly in the application of ICT in the business and more specifically in the HE sector.

Descriptor 1: Knowledge, Research, and Analysis

Several business areas are considered as critical for the success of a KM effort. The organization's structure, systems, technology, and skills should all be in alignment with its goals and direction. The critical success factors include the organizational structure, strategy and leadership, technological infrastructure, culture, organizational processes, and measurement. Thus, it was necessary for me as a researcher in the area of KM to get involved with all of the above fields of study up to a certain degree in order to gain a sufficient understanding of the implications of each area and the way that all of the components must be combined for a successful KM implementation.

As part of the background research for this study I therefore engaged in finding, reviewing, and analyzing a substantial amount of academic literature in order to acquire the spherical view necessary for conceptualizing KM. The task was not easy, as I had to run several separate searches in different sources since the research output of different researchers was reported in academic journals and sources relating to many different areas of focus. And when identified, studying and critically analyzing all of the research output were equally challenging tasks as they involved work of scientists coming from different backgrounds, working on different disciplines and thus, approaching and analyzing the topic of KM from completely different perspectives. Nevertheless, the task of acquiring this varied knowledge and putting together all pieces to complete the jigsaw puzzle was very interesting though at times it cost me considerable time delays.

The journey towards the completion of this doctorate study was very lengthy for me both due to some inactive periods but also due to the fact that the different components of KM were very exciting on their own and many times I found myself pursuing them further than necessary for this research study. This more in-depth study of some areas paid off by some publications made on related topic areas such as for example business intelligence and content management. But it was not always the case that the by-products of the research study could be utilized as was for example the development of a software application to be used by the university Senate which at the end was scrapped since it gave its place to other technologies which were seen as more suitable for satisfying new broader requirements of the organization.

Critical analysis of the literature in all involved sub-areas relating to KM helped me conceptualize the whole picture and understand the work involved, clarify my research objectives and as a result I was able to identify and utilize the appropriate methodological approaches and tools for addressing the research objectives.

The knowledge I gained on how to plan and execute the qualitative and the quantitative survey activities involved in the study as well as the practical skills acquired from the use of SPSS, the dedicated software used for the analysis of the results, are very important. I expect that such knowledge and skills will be valuable for future research activities as well.

Descriptor 2: Synthesis and Evaluation

As the nature of KM was such that it involved a number of business areas, a problem decomposition approach was selected. The approach offers for each component to be considered separately and at the end to put them all together to synthesize the KM environment. The theory was there but its application was the biggest challenge. The cases reporting KM use in an academic setting were by a lot fewer than those describing KM practices in other types of

organizations. As it has been the case with information and communication technology (ICT) use in academia in the past, when research showed that there was slow infiltration of new technologies in a HEI setup, the same latency effect seemed to also be describing KM use in higher education. On top of that, certain research showed that there is rather a latent or open hostility from some teachers or administrative staff to exploit fully the functionality of information systems (McDermott & O'Dell, 2001). Thus, the challenge of applying KM practices in a HEI was becoming more intense.

The study required the careful examination of all of the identified KM enablers. As a practitioner-researcher I had good knowledge of the particular environment which I needed to serve but the collection, interpretation, and management of both qualitative and quantitative data from all of the stakeholders of the HEI were absolutely necessary. To manage these tasks effectively and efficiently I had to first of all become comfortable with the research methodologies and the research tools that the study involved. Thus, at the practical level, I learned to:

- Design, administer, and process questionnaires;
- Conduct interviews;
- Plan and hold focus group sessions;
- Record, analyze and interpret the quantitative and qualitative data collected from the above activities.

Descriptor 3: Problem Solving

Facing problems and finding solutions which will allow one to complete the considerable amount of work involved in a doctorate study and do this at the level required for doctorate studies is, I believe, a life experience.

For me the biggest problem throughout this doctorate study has been time management. My full-time work obligations as a faculty member of the HEI and additional responsibilities of a program coordinator on one hand combined with the more than full-time responsibilities of a mother of three wonderful boys on the other hand has been the biggest challenge from the beginning to the completion of this journey.

There were also periods of time when I had to take time off and therefore be inactive. These were imposed by some very sad events being my father's illness with cancer and his death, and some very happy events being the birth of my third son; both events required my full devotion and attention at the time.

Finding the courage to return to the study every time was also owed to my family, especially my husband who has been very supportive to me and to whom I owe big thanks. Also, to some good friends and colleagues who were always encouraging me to continue.

Resuming after long periods of interruption feels like starting over, almost. Literature, needs to be reviewed again, objectives need to be re-clarified, putting things into perspective is necessary, re-scheduling all activities, getting back focused on the work, all feel very painful tasks. Nevertheless, the smallest progress is the best encouragement to continue and continue until the end.

Other than the time issue, no major problems were faced. Some small technical problems, such as for example, which tool to use for the design of the online questionnaire were solved and work moved on. Another challenge I faced at the time of data collection was to find ways to increase the response rate in the survey. This was dealt with using follow-up reminders.

One major decision involved the completion and inclusion in the doctorate study of a software database application which I developed to automate the work of the Senate. Finally, I decided not to include this application in the doctorate study, even though it meant a whole summer's work, due to the fact that when resuming work after one of the interruptions the study moved to a different direction with a different technological solution serving the involved tasks more appropriately than the developed application. I consider my main role in the study, as far as the HEI is concerned, to be the role of a specialized consultant offering to the organization the best advice. Being such a consultant I needed to take the painful decision to put aside the work done and concentrate on the new technologies.

Descriptor 4: Self-Appraisal and Management of Learning

This doctorate study involved a number of smaller studies directed towards different disciplines but all related and absolutely necessary for the completion of the objectives of the study. A variety of research methodologies, along with multiple alternative approaches and tools, different data collection techniques, all needed to be combined in a thorough plan of action. All of the steps necessary to fulfill the study's objectives were identified and planned from the beginning of the study.

During the study I needed to consult with area experts for different issues. For example I had to consult a social scientist regarding resources in the area of organizational behaviour and leadership, as well as other experts in management and other areas which needed to be studied. At the time of questionnaire design I talked with statisticians to get advice regarding the questionnaire and later on again regarding the statistical tools to use for the analysis of the data. I also consulted with IT specialists to get the latest information regarding available technologies. At the initial stages of the study I attended a number of research seminars to familiarize myself with different research methodologies, approaches, and tools and got in touch with other doctorate candidates to share experiences and offer moral support one to another. All of this

communication and cooperation I consider very important and the knowledge shared very valuable.

Looking back at the journey the only thing which I would have changed would be to try to avoid the detours which meant a change of focus which was associated with short to long delays as far as this study is concerned. Nonetheless, nothing was done in vein, and every single activity was associated with additional learning relating to the area being investigated.

Descriptor 5: Communication

Communication skills were necessary at several stages of the project. For example, conducting the focus groups sessions was an activity which required a lot of planning, good control and definitely effective communication with the colleagues who were taking part in the focus group. The same goes for the planning and execution of the interviews which were held with the top executives of the HEI. Communication with the specialists who were consulted on different subject matters was also needed at different times. Finally, the communication channels with the supervisor and the advisor of the project had to be kept open throughout the study.

The findings of the study were collected into an executive report which was presented to top executives of the HEI during a common meeting.

Partial results of the study were presented and published in refereed conferences and journals.

Descriptor 6: Responsibility and Ethical Understanding

My responsibility in relation to this doctorate study involved the delivery of the proposed research proposal objectives as these were outlined in the Learning Agreement with which I was admitted into the doctorate study program. The Learning Agreement was an agreement between three parties being the HEI, my employer; Middlesex University, the institution offering the doctorate program of study; and myself. I was therefore held responsible in relation to both institutions for the completion of the study as described in our agreement and the delivery of the set objectives.

My broad responsibility towards the HEI, my employer, involved the execution of a study and the development of a plan of action for the adoption of KM by the HEI. The successful implementation of this plan of action would benefit the whole organization, and all of its stakeholders to whom I was indirectly in debt. Moreover, as my work was affecting the work of all of the organization's stakeholders more so the staff and faculty, and the management, I had a moral and ethical obligation to consider everyone's needs, requirements, well-being, benefits, rights and responsibilities and offer advice which would benefit them all, and the organization as a whole.

Furthermore, for the completion of this study I got the consent of the management of the HEI for the execution of the survey and the use of data concerning staff and student statistics. Such data made available to me were used with caution regarding its sensitivity and only to the degree necessary.

The cooperation of my colleagues through their participation in the study was done with their consent which they demonstrated by signing a consent form in the case of participants to focus groups, and also in the case of replying to the printed form of the questionnaire. As for the online questionnaire, participation was completely voluntary and additionally replying to any question was optional. This was clearly stated in the description page which preceded the questions.

In dealing with the participants in all forms of the survey, being focus groups, interviews, and questionnaires, and the ethical issues relating to their participation, the following were carefully observed and maintained:

Anonymity: Participants were assured of the confidentiality and the secure storage of the primary data collected as well as the anonymity of their contribution to the study. Such anonymity was also guaranteed for the analysis and the reporting and the research findings.

Consent: Participants were free to consent or not to the participation in the study both in regards to the focus groups as well as the interviews. As for the participation to the survey questionnaire it was clearly stated that this was completely voluntary.

Disloyalty: Focus groups' participants were reassured that their identity would be concealed and the views expressed would be presented in such ways which would secure their anonymity.

Following the collection of the data all of the materials collected were carefully stored in a secure place accessible only by myself. The details of the findings have been presented to top executives of the HEI. Only with the institution's consent results of the survey may be published further for the benefit of the academic community.

The delivery of the executive report to management with specific suggestions regarding the future course of action, the completion of the case study which served to guide future efforts for the implementation of KM practices in this and other HEIs as well as the detailed study presented herewith complete the study of KM in HE using a stakeholder approach.

In conclusion of my doctorate journey I have a strong urge to refer to a famous poem by a famous Greek poet. This is no other than "Ithaca" by Constantinos Cavafy. The poem is an inspiration in so many ways for all of those things in our lives which though long and demanding, requiring a lot of sacrifices and a lot of work, are upon their completion most rewarding, satisfying and fulfilling

not only for what has been accomplished as an end output but mostly for all of the life experiences they have offered one in the whole duration of the journey. This describes my thoughts and feelings at this time that I am completing my doctorate study.

8.3. Conclusion

I completed this chapter to reflect on my journey of the doctorate study and the achievements made upon its completion. I hereby cite my self-reflection on the Doctorate in Professional Studies' level 5 descriptors and learning outcomes.

Section V

Appendices

Appendix A – Comparison of Features Offered by Different KMSs

Appendix B – Data Collection Documents

Appendix C – Survey Data Analysis; Statistics' Tables

Appendix D – University Strategy (Corporate Plan 2010-11 to 2014-15)

Appendix E – University IT Strategy (Draft – 2002)

Appendix F – Review of Content Management Systems (CMS)

APPENDIX A: Comparison of Features Offered by Different KMSs (SAP NetWeaver, Lotus Notes, Siebel, Confluence, and MS Sharepoint)

It should be noted that as reported by its developer the table below includes the developer's experiences with the mentioned software packages. (Karayiannides G. (BSc thesis supervised by Stylianou, 2006))

		SAP NetWeaver	*LOTUS NOTES*	*SIEBEL*	*CONFLUENCE*	*MS SHAREPOINT*
1.0	**INTEGRATION**					
1.1	Suitable for structured information					
1.2	Suitable for unstructured information	✓				
1.3	Suitable for both types (structured and unstructured information)		✓		✓	✓
1.5	Suitable to be extensible through plug-ins		✓	✓	✓	✓
2.0	**SEARCH FACILITIES**					
2.1	Search by content	✓	✓		✓	✓
2.2	Search by topic	✓	✓		✓	✓
2.3	Search for structure information only					
2.4	Search for unstructured information only					
2.5	Search for both types (structured and unstructured)	✓	✓		✓	✓
2.6	Search for multiple types of documents (PDF files, HTML, text files)	✓	✓		✓	✓
2.7	Users are allowed to search in any other language than English	✓	✓			✓
2.8	The user has control over the navigation	✓	✓		✓	✓
2.9	Search is provided only for "stuff" within the organization		✓			✓
2.10	Search is provided for "stuff" outside and inside the organization	✓				✓
2.11	The system offers single search across several domains at the same time	✓	✓		✓	✓
2.12	The user can save the searches he has made				✓	
2.13	The search technology of the system find documents relevant to the subject even when the query does not appear in the document	✓			✓	
3.0	**CATEGORIZATION**					
3.1	The system provides categorization of information	✓	✓	✓	✓	✓
3.2	The system taxonomy the information	✓	✓	✓	✓	✓
3.3	Content can be viewed in a number of different ways (alphabetically, hierarchically or by date)	✓	✓	✓	✓	✓
3.4	Linking between pages				✓	✓
3.5	Content map feature is provided		✓			
3.6	Headline Page is provided		✓			
4.0	**COLLABORATION**					
4.1	The feature of collaboration is provided by the system		✓	✓	✓	✓
4.2	Creating sites from MS office or portal					✓
4.3	Add/delete/edit sites to directory					✓
4.4	Surveys are able to be created and their results are calculated and made available automatically.					✓
4.5	Users can enter easily discuss their group ideas through spaces		✓	✓		✓
5.0	**PERSONALIZATION AND PROFILING**					
5.1	The feature of personalization is provided by the system	✓	✓	✓	✓	✓
5.2	Users are able to personalize documents	✓	✓	✓	✓	✓
5.3	Each user has a profile that can edit		✓	✓	✓	✓
5.4	Alerts the users for new messages and information	✓	✓	✓	✓	✓

6.0	**WORKFLOW**					
6.1	Users can manage and track projects throughout a workgroup across the enterprise					✓
6.2	Provides workflow tools such as browser, e-mail client, RSS/New aggregator and RDF formats.		✓	✓	✓	✓
7.0	**DECISION SUPPORT**					
7.1	Technology of text mining provided	✓				
7.2	The system provides automatic summarization	✓				
8.0	**USER INTERFACE**					
8.1	Easy to use		✓		✓	✓
8.2	Minimal or no training is needed		✓		✓	✓
8.3	Highly interactive user interface	✓	✓		✓	✓
8.4	The user interface provides a single point of access and utilize space effectively (dashboard)		✓		✓	✓
9.0	**SECURITY AND USERS RIGHTS MANAGEMENT**					
9.1	Authorization need to access the information	✓	✓	✓	✓	✓
9.2	The system can be integrated with security applications	✓	✓		✓	✓
9.3	Users can limit access to their work to particular people.	✓	✓		✓	✓
10.0	**MANAGEMENT/STATISTICS**					
10.1	The system keeps track of the “living history” of documents (how many times has it been opened, who has opened it, when was the last time it was opened etc.)	✓	✓			✓
11.0	**INNOVATION**					
11.1	The system is suitable for bringing people together in “virtual” development teams, creating forums for brainstorming and collaboration.		✓		✓	✓
12.0	**OTHER**					
12.1	Users can share their ideas through e-mail like format				✓	✓
12.2	The system offers a portal for news announcements				✓	✓
12.3	The portal can be seen only by authorized personnel				✓	✓
12.4	Exchange of knowledge is offered through spaces				✓	✓
12.5	Images can be shared through the company				✓	✓
12.6	The system is administered through the web				✓	✓
12.7	RSS feature is provided				✓	✓

APPENDIX B: Data Collection Documents

The KM Employee Questionnaire and Accompanying Documents

Knowledge Management Practices in UNic, 2014

Consent Form for Participation in a Research Study

Introduction

By signing this form you voluntarily agree to participate in a research study entitled: "Knowledge Management Practices in UNic, 2014", to be carried out by Vasso Stylianou, DProf. Cand. Middlesex University, as part of her DProf research study.

Confidentiality

The study research records will be kept confidential and you will not be identified in any written or verbal reports. The records will be kept in a secured area and locked in a file cabinet in the research office of the investigator. Only research personnel authorized by the investigator will have access to these records. All research records will be kept for a period of six months and subsequently all written records will be destroyed. Your records may also be inspected by the Research Ethics Committee of the University of Nicosia. Any statistics published from this survey will be carefully checked to ensure that no information that relates to any identifiable individual is being revealed.

Questions

If you require assistance in the completion of this questionnaire or have any questions regarding the survey, please contact:

Vasso Stylianou, Department of Computer Science, School of Sciences and Engineering, University of Nicosia.

Telephone: 22841647, E-mail: stylianou.v@unic.ac.cy.

If you believe you sustain any injury related to this study, you can call the DProf Consultant, Dr Andreas Savva at 22841654, or the Administrator of The Research Ethics Committee of the University of Nicosia at 22841500.

STUDY SPECIFICS

Purpose

This survey is being conducted to measure the extent to which knowledge management practices are used or will be used by the University of Nicosia (UNic) and the potentials of the UNic as a learning organization.

Procedure

As part of this study you will be asked to complete a questionnaire, which asks questions about knowledge management practices in the UNic. Your cooperation is essential for the results of the survey to be valid and reliable, and it is therefore highly appreciated. We would like to encourage you to answer all of the questions. However, the survey remains completely voluntary and if any question makes you feel uncomfortable you may skip it.

Risks

There are no risks by participating in this study.

Benefits

Participation in this study will not provide any direct benefit to you.

Participation

Your participation in this study is voluntary.

I have read the above information and I consent in participating in this research study.

If you are interested in receiving a summary of the findings of this survey, please send a blank email to stylianou.v@unic.ac.cy.

Knowledge Management Practices in UNic, 2014 (Employee Questionnaire)

This survey is being conducted to measure the extent to which knowledge management (KM) practices are used or will be used by the University of Nicosia (UNic) and the potentials of the UNic as a learning organization.

The primary objectives of this survey are to determine the business practices used or planned to support the sharing, transfer, acquisition and retention of knowledge by the UNic and whether the organization finds these practices effective.

Data collected in this survey will result in a greater understanding of knowledge management practices to support enhanced learning and performance by the organization.

For statistical purposes only, please provide the following information.

Total years of work experience:

o 0-2
o 3-5
o 6-9
o 10+

Total years of management experience (if any):

o 0-2
o 3-5
o 6-9
o 10+

Total years with current organization:

o 0-2
o 3-5
o 6-9
o 10+

Employment Terms:

o Full-time
o Part-time

School:

o Business
o Education
o Humanities, Social Sciences and Law
o Sciences and Engineering
o Medical

Age:

o 20-29
o 30-39
o 40-49
o 50-59
o 60+

Gender:

o Male
o Female

PART A

Knowledge management involves any systematic activity related to the capture and sharing of knowledge by the organization.

1. **Please indicate which of the following specific KM projects you recognize as being available in UNic.**

   From A-O check ALL that apply

- o A) A portal that supports collaboration, knowledge sharing and document management
- o B) Knowledge repositories
- o C) Online forums, email lists, web-based communities and/or chat rooms to encourage the creation of virtual communities of practice
- o D) Real time expert contact
- o E) Robust connectivity to: the intranet, knowledge repository, and/or communities of practices including real time expert contact
- o F) A wireless network around the university
- o G) Designated knowledge support officers who assist in creating, editing and translating knowledge assets
- o H) Decision support tools
- o I) Groupware to support collaboration
- o J) Data warehouses
- o K) Internal networks of knowledge employees

L) An intranet for:
- o Students
- o Faculty
- o Non-faculty

M) Community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among:
- o Students
- o Faculty
- o Non-faculty

- o N) A document management system (DMS)
- o N1) The content of the DMS is frequently checked to ensure quality by filtering out irrelevant, unsolicited and expired contributions
- o N2) The content of the DMS is supplemented by meta-content like directories, search engines and indexing
- o O) Other

2. **Please indicate the use UNic makes of each of the listed KM practices (IN USE NOW), and the level of importance you attribute to it (IMPORTANCE -YOUR OPINION).**

   Check ONE response from each scale for each item

A) UNic has a written KM policy or strategy

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important

- Important
- Critical

B) UNic has a value system or culture intended to promote knowledge sharing

IN USE NOW?
- YES
- NO
- DON'T KNOW

IMPORTANCE - YOUR OPINION
- Not at all important
- Somewhat important
- Important
- Critical

C) UNic has policies or programs intended to improve employee retention

IN USE NOW?
- YES
- NO
- DON'T KNOW

IMPORTANCE - YOUR OPINION
- Not at all important
- Somewhat important
- Important
- Critical

D) UNic uses partnerships or strategic alliances to acquire knowledge

IN USE NOW?
- YES
- NO
- DON'T KNOW

IMPORTANCE - YOUR OPINION
- Not at all important
- Somewhat important
- Important
- Critical

E) In UNic KM practices are a responsibility of managers and executives

IN USE NOW?
- YES
- NO
- DON'T KNOW

IMPORTANCE - YOUR OPINION
- Not at all important
- Somewhat important
- Important
- Critical

F) In UNic KM practices are a responsibility of non-management employees

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

G) In UNic KM practices are a responsibility of the knowledge officer or KM unit

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

H) In UNic KM practices are explicit criteria for assessing employee performance

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

I) UNic specifically rewards knowledge sharing with monetary incentives

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

J) UNic specifically rewards knowledge sharing with non-monetary incentives

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

K) UNic regularly captures and uses knowledge obtained from other research institutes including universities and government agencies

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

L) UNic regularly dedicates resources to detecting and obtaining external knowledge and communicating it within the organization

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

M) UNic regularly encourages employees to participate in project teams with external experts

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

N) UNic provides formal training related to KM practices

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important

- Important
- Critical

O) UNic provides informal training related to KM practices

IN USE NOW?
- YES
- NO
- DON'T KNOW

IMPORTANCE - YOUR OPINION
- Not at all important
- Somewhat important
- Important
- Critical

P) UNic uses formal mentoring practices, including apprenticeships

IN USE NOW?
- YES
- NO
- DON'T KNOW

IMPORTANCE - YOUR OPINION
- Not at all important
- Somewhat important
- Important
- Critical

Q) UNic encourages experienced employees to transfer their knowledge to new or less experienced employees

IN USE NOW?
- YES
- NO
- DON'T KNOW

IMPORTANCE - YOUR OPINION
- Not at all important
- Somewhat important
- Important
- Critical

R) UNic encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses

IN USE NOW?
- YES
- NO
- DON'T KNOW

IMPORTANCE - YOUR OPINION
- Not at all important
- Somewhat important
- Important
- Critical

S) UNic offers training to employees in order to keep skills current

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

T) In UNic employees share knowledge / information by regularly updating databases of good work practices, lessons learned or listings of experts

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

U) In UNic employees share knowledge / information by preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

V) In UNic employees share knowledge / information by facilitating collaborative work by project teams that are physically separated (“virtual teams”)

IN USE NOW?
- o YES
- o NO
- o DON'T KNOW

IMPORTANCE - YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

3. Please indicate the level of importance you attribute to each reason for using KM practices in UNic at the present and / or in the future.

Check ONE response for each item

	Not at all important	Somewhat important	Important	Critical
A) To improve the competitive advantage of UNic				
B) To help integrate knowledge within UNic				
C) To improve the capture and use of knowledge from sources outside UNic				
D) To improve sharing or transferring of knowledge with partners in strategic alliances, joint ventures or consortia				
E) To increase efficiency by using knowledge to improve the end-user service and product				
F) To protect UNic from loss of knowledge due to employees' departures				
G)To train employees to meet strategic objectives of UNic				
H) To increase employee acceptance of innovations				
I) To improve employee retention				
J) To identify and/or to protect strategic knowledge present in UNic				
K) To capture employees' undocumented knowledge (know-how)				
L) To ease collaborative work of projects or teams that are physically separated				
M) To promote sharing or transferring knowledge with stakeholders				
N) To relieve information overload problems within UNic				
O) To catch-up with competitors' use of KM tools or practices				
P) Other				

4. In the table below, please indicate the level of effectiveness you attribute to these results for the KM practices you experienced in UNic.

Check ONE response for each item

	Not at all effective	Somewhat effective	Effective	Very effective
A) Using KM practices increased our knowledge sharing horizontally (across departments, functions or business units)				
B) Using KM practices increased our knowledge sharing vertically (up the organizational hierarchy)				
C) Using KM practices improved employee efficiency and / or productivity				

D) Using KM practices improved skills and knowledge of employees				
E) Using KM practices increased our number of markets (more geographic locations)				
F) Using KM practices improved stakeholder relations				
G) Using KM practices helped us add new products or services				
H) Using KM practices increased our adaptation of products or services to stakeholder requirements				
I)Using KM practices increased flexibility in product delivery and innovation				
J) Using KM practices prevented duplicate research				
K) Using KM practices improved our corporate or organizational memory				
L) Using KM practices increased our ability to capture knowledge from public research institutions including universities and government agencies				
M) Using KM practices increased our ability to capture knowledge from other business enterprises, industrial associations, technical literature, etc.				
N) Using KM practices improved involvement of employees in the workplace activities				

5. Are you familiar whether UNic measures the effectiveness of its KM practices?

o No

o Yes

6. Which of the following groups is responsible for the KM practices currently in use in UNic?

From A-K check ALL that apply

o A) Human Resources
o B) Information Technology
o C) Knowledge Management Unit
o D) Distance Learning Unit
o E) Library
o F) Documentation Centre
o G) Executive Management Team (direct responsibility)
o H) Department / School
o I) Nobody
o J) Don't know
o K) Other

PART B

A learning organization is one that learns continuously and transforms itself.

Learning is a continuous, strategically used process, integrated with and running parallel to work

1. Using the table below, please indicate the learning practices currently in use in UNic.

Check ONE response for each item

	Never	Sometimes	Often	Always
A) In UNic employees openly discuss experiences in order to learn from them				
B) In UNic employees identify skills needed for future work tasks				
C) In UNic employees help each other learn				
D) In UNic employees can get money and other resources to support their learning				
E) In UNic employees can get time off to support learning				
F) In UNic employees view problems and new directives as an opportunity to learn				
G) In UNic employees are rewarded for learning				
H) In UNic employees give open and honest feedback to each other				
I) In UNic employees listen to others' views before speaking				
J) In UNic employees are encouraged to state their opinion regardless of rank				
K) In UNic employees treat each other with respect				
L) In UNic employees spend time building trust with each other				
M) In UNic teams/groups have the freedom to adapt their goals as needed				
N) In UNic teams/groups treat members as equals, regardless of rank, culture, or other differences				
O) In UNic teams/groups focus both on the group's task and on how well the group is working				
P) In UNic teams/groups revise their thinking as a result of group discussions or information collected				
Q) In UNic teams/groups are rewarded for their achievements as a team/group				
R) UNic uses two-way communication, such as suggestion systems, electronic communication, open meetings, etc., on a regular basis				
S) UNic enables its people to get needed information at any time quickly and easily				
T) UNic maintains an up-to-date database of employee skills				

U) UNic creates systems to measure gaps between current and expected performance				
V) UNic shares good-practices and lessons-learned among all employees				
W) UNic measures the results of the time and resources spent on learning				
X) UNic invites people to contribute to the organization's vision				
Y) UNic gives people control over the resources they need to accomplish their work				
Z) UNic considers the impact of decisions on employee morale				
AA) UNic works together with the outside community to meet mutual needs				
AB) UNic encourages people to get answers from across the organization when solving problems				
AC) UNic leaders generally support requests for learning opportunities and training				
AD) UNic leaders share up-to-date information with employees about competitors, industry trends, and organizational directions				
AE) UNic leaders empower others to help carry out the organization's vision				
AF) UNic leaders mentor and coach those they lead				
AG) UNic leaders ensure that the organization's actions are consistent with its values				

Your response is very much appreciated.

Thank you for participating.

Cover Email (Invitation for Participation in the Research Study)

Dear colleagues

"The only true wisdom is in knowing you know nothing." - Socrates

"The only source of knowledge is experience. Learning is experience. Everything else is just information." – Albert Einstein

Knowledge is valued as a corporate asset and for academic institutions it may be argued that this is the most important asset. Knowledge Management (KM) is a concept in which an enterprise gathers, organizes, shares, and analyzes the knowledge of individuals and groups across the organization in ways that directly affect performance.

KM and in particular KM practices in the University of Nicosia (UNic), is the area of investigation of my doctorate research study. I currently conduct a survey to measure the extent to which knowledge management practices are used or will be used by UNic and the potentials of UNic as a learning organization.

Data collected in this survey will result in a greater understanding of knowledge management practices to support enhanced learning and performance by the organization. At the same time please note that all collected data are CONFIDENTIAL, CODED, and ANONYMOUS in any analysis of results and/or publications.

All employees, staff and faculty, may complete the survey:

A. Online from http://kwiksurveys.com/s.asp?sid=wo7yzkdar2o2fcb419769. **OR**
B. Hard-copy (file attached) which you may either send to stylianou.v@unic.ac.cy or deposit in my mail box (no. 57, main building, before lab B111).

Your participation is essential at this stage of the study and I will greatly appreciate it. Please complete the survey by the 29th of September, if possible.

Many thanks

Best regards

Vasso

Knowledge Management Practices in UNic, 2014 (Student Survey)

Consent Form for Participation in a Research Study

Introduction

By signing this form you voluntarily agree to participate in a research study entitled: "Knowledge Management Practices in UNic, 2014 (Student Survey)", to be carried out by Vasso Stylianou, DProf. Cand. Middlesex University, as part of her DProf research study.

Confidentiality

The study research records will be kept confidential and you will not be identified in any written or verbal reports. The records will be kept in a secured area and locked in a file cabinet in the research office of the investigator. Only research personnel authorized by the investigator will have access to these records. All research records will be kept for a period of six months and subsequently all written records will be destroyed. Your records may also be inspected by the Research Ethics Committee of the University of Nicosia. Any statistics published from this survey will be carefully checked to ensure that no information that relates to any identifiable individual is being revealed.

Questions

If you require assistance in the completion of this questionnaire or have any questions regarding the survey, please contact:
Vasso Stylianou, Department of Computer Science, School of Sciences and Engineering, University of Nicosia.
Telephone: 22841647, E-mail: stylianou.v@unic.ac.cy.

If you believe you sustain any injury related to this study, you can call the DProf Consultant, Dr Andreas Savva at 22841654, or the Administrator of The Research Ethics Committee of the University of Nicosia at 22841500.

STUDY SPECIFICS

Purpose

This survey is being conducted to measure the extent to which knowledge management practices are used at the University of Nicosia (UNic).

Procedure

As part of this study you will be asked to complete a questionnaire, which asks questions about knowledge management practices in UNic. Your cooperation is essential for the results of the survey to be valid and reliable, and it is therefore highly appreciated. We would like to encourage you to answer all of the questions. However, the survey remains completely voluntary and if any question makes you feel uncomfortable you may skip it.

Risks

There are no risks by participating in this study.

Benefits

Participation in this study will not provide any direct benefit to you.

Participation

Your participation in this study is voluntary.

I have read the above information and I consent in participating in this research study.

If you are interested in receiving a summary of the findings of this survey, please send a blank email to stylianou.v@unic.ac.cy.

Knowledge Management Practices in UNic, 2014 (Student Survey)

This survey is being conducted to measure the extent to which knowledge management (KM) practices are used at the University of Nicosia (UNic).

The primary objectives of this survey are to determine the business practices used to support the sharing, transfer, acquisition and retention of knowledge by the UNic.

Data collected in this survey will result in a greater understanding of knowledge management practices to support enhanced learning and performance by the organization.

For statistical purposes only, please provide the following information.

Age:

- o 17-20
- o 21-23
- o 24-26
- o 27+

Gender:

- o Male
- o Female

School:

- o Business
- o Education
- o Humanities, Social Sciences and Law
- o Sciences and Engineering
- o Medical

Year of study (Credits completed):

- o Freshman (0-32)
- o Sophomore (33-64)
- o Junior (65-96)
- o Senior (97+)

Definition:
Knowledge Management (KM) involves any systematic activity related to the capture and sharing of knowledge by the organization.

Please indicate which of the following specific KM projects and practices you recognize as being available in UNic (IS AVAILABLE?), and the level of importance you attribute to it (IS IMPORTANT? YOUR OPINION).

Check ONE response from each scale for each item

A) An intranet for students

IS AVAILABLE?

- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION

- o Not at all important
- o Somewhat important
- o Important
- o Critical

B) A portal that supports collaboration, knowledge sharing and document management

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

C) Community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among students

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

D) Community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among students and faculty

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

E) Online forums, email lists, web-based communities and/or chat rooms to encourage the creation of virtual communities of practice

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

F) Real time expert contact

IS AVAILABLE?
- o YES

- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

G) A wireless network around the university

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

H) Groupware to support collaboration

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

I) Social media

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

J) Mobile content and apps

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important

- o Critical

K) The university organizes or holds conferences, trade shows, seminars, educational summits, training sessions, and/or panel discussions for students

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

L) Students share a sense of direction, excitement, trust (that information received will be the best), and willingness to continually learn from others

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

M) Students share knowledge / information by regularly updating databases of good work practices, lessons learned, etc.

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

N) There exists within the university continuous quest for knowledge especially among all students

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

O) UNic dedicates resources to detecting and obtaining external knoweledge and communicating it within the organization

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

P) The employees and/or students within UNic practice knowledge sharing

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

IS IMPORTANT? YOUR OPINION
- o Not at all important
- o Somewhat important
- o Important
- o Critical

Q) Other

IS AVAILABLE?
- o YES
- o NO
- o DON'T KNOW

Your response is very much appreciated.

Thank you for participating.

In-Depth Interviews – Question Set

Interview with: Date & Time:

Hello. Thank you. Confidentiality and anonymity.

A. Knowledge Management

Knowledge management *involves any systematic activity related to the capture and sharing of knowledge by the organization.*

1. Which of the following KM practices do you use?

- ◯ A. Knowledge repositories
- ◯ B. A portal that supports collaboration, knowledge sharing and document management
- ◯ C. Community(ies) of practice(s) e.g. learning network, thematic group, special interest group
- ◯ D. Online forums, email lists, web-based communities and/or chat rooms
- ◯ E. Real time expert contact
- ◯ F. A document management system (DMS)
- ◯ G. Decision support tools
- ◯ H. Groupware to support collaboration
- ◯ I. Data warehouses
- ◯ J. Internal networks of knowledge employees

2. What is your opinion about UNic's actions towards:

- ◯ A. Proper planning and strategies are in place to manage content
- B. The university organizes or holds conferences, trade shows, seminars, educational summits, training sessions, and/or panel discussions for Students ◯ Faculty ◯ Non-faculty ◯
- ◯ C. Employees and students share a sense of direction, excitement, trust (that information received will be the best), and willingness to continually learn from peers
- ◯ D. There exists within the university continuous quest for knowledge especially among all employees
- ◯ E. The employees and/or students within UNic practice knowledge sharing
- ◯ F. There has been evidence of positive and/or negative changes of behaviour among members of UNic with regards to knowledge sharing.

  Positive like:

  Negative like:

- ◯ G. There have been changes in the processes within UNic which encourage the development and sharing of knowledge
- ◯ H. UNic promotes internal cooperation among employees
- ◯ I. UNic promotes external cooperation with industry consortia and other institutes
- ◯ J. UNic promotes collaborative research with external partners
- ◯ K. Substantial investments were made in the development and deployment of a KMS in UNic

◯ L. There are networks for transferring information between employees who interact with clients (students/parents) and other external agencies

◯ M. There exist formal procedures to ensure that lessons learned are passed along to others doing similar tasks

3. What kinds of activities in UNic have the biggest impact on the bottom line?

   Of the activities you mentioned, which one probably has the biggest impact?

4. What kinds of knowledge, if you had it, would make this activity work more effectively/ efficiently?
5. What is your primary source of work-related information? (Email, Word of mouth (informal), Meetings, Documents on shared drive, intranet, …)
6. What is the primary method of storing information you generate during the course of your work? (Folder on personal computer, personal paper files, folder on shared drive, as email attachment, other)
7. Does your department/office have a formal document library?

   Yes, shared drive; no

8. How do you currently promote the availability of information produced by you / section?

   News bulletins, email, at events, post to website, post on intranet, other …

   work templates, …)

9. Do the KM practices currently in use in UNic have dedicated budgets or spending?

   Yes ◯ No ◯

10. Did UNic experience significant resistance to implementing any of the KM practices currently in use? Yes ◯ No ◯
11. Please indicate how important the following priorities are to your organization's 2014 KM agenda. 1- One of our top priorities; 2- On our agenda, but not a top priority; 3- Not a focus for us
    A. Enabling sharing and collaboration within and across teams/units
    B. Capturing content and explicit knowledge
    C. Embedding KM tools and approaches in business processes and workflows
    D. Content management, infrastructure, and search
    E. Eliciting and transferring tacit knowledge
12. Which of the following trends do you expect to be part of your KM program in 2014?

A. Social media for the enterprise
B. “Big data” and analytics
C. Mobile content and apps
D. Cloud computing
E. Gamification

B. Learning Organization (LO)

A LO is one that learns continuously and transforms itself. Learning is a continuous, strategically used process, integrated with and running parallel to work. LO must demonstrate three key components: 1) systems-level, continuous learning; 2) this learning then generates and manages knowledge outcomes; and 3) these outcomes lead to improvement in the organization’s performance and value.

1. All organizations learn but for some learning becomes an intentional part of the business strategy. Do you believe UNic is such a LO?

2. From the table which is shown to you now which are the 2-3 things you believe UNic is best at, and which ones do you perceive as most problematic (those that would need more work to be satisfied)?

C. Knowledge Organization (KO)

A KO is a LO that practices KM efficiently.

1. Do you believe UNic is a KO?

Is there anything you would like to add or comment on?

Thank you very much for your time and support.

Cover Email (Request for Interview)

Dear

You already read in my previous email about my doctorate research on Knowledge Management (KM) with particular interest in our KM practices in UNic. Further to the survey conducted via the questionnaire sent in the previous email, I would like to ask for your kind participation in the collection of the administrators' viewpoints on issues relating to our UNic viewed as a knowledge organization. I will be calling you to arrange a meeting at a time convenient to you.

I will greatly appreciate your assistance at this critical stage in my doctorate journey which once completed will hopefully assist us in improving our corporate efficiency.

Thanks a lot.

Best regards

Vasso

Cover Email (Request for Participation in a Focus Group)

Focus Group 1

Dear colleagues

You already read in my previous email about my doctorate research on Knowledge Management (KM) with particular interest in our KM practices in UNic. Further to the survey conducted via the questionnaire sent in the previous email, I would like to ask for your kind **participation in a focus group meeting discussing "UNic; A Knowledge Organization?"**. The focus group will be comprised of senior faculty members with administrative duties, i.e., Heads of departments, and Deans of schools. I would like to propose two days waiting for your response in order to finalize our meeting.

Please consider: Wednesday, 24/9, from 14:30-16:00

or Thursday, 25/9, from 11:00-12:30

I will greatly appreciate your assistance at this critical stage in my doctorate journey.

Thanks a lot.

Best regards

Vasso

Focus Group 2

Dear colleagues

You already read in my previous email about my doctorate research on Knowledge Management (KM) with particular interest in our KM practices in UNic. Further to the survey conducted via the questionnaire sent in the previous email, I would like to ask for your kind **participation in a focus group meeting discussing "UNic; A Knowledge Organization?"**. The focus group will be comprised of senior staff members. I would like to propose two days waiting for your response in order to finalize our meeting.

Please consider: Thursday, 25/9, from 14:30-16:00

or Friday, 26/9, from 11:00-12:30

I will greatly appreciate your assistance at this critical stage in my doctorate journey.

Thanks a lot.

Best regards

Vasso

APPENDIX C: Survey Data Analysis – Statistics' Tables

Employee Survey

Table 21. KM Practices in Use within the HEI

Code	KM Practices in Use Within the HEI N range: 63-71; N average: 67.3	Yes %	No %	Don't know %
	Policies and Strategies The HEI:	33.0	28.7	38.3
A	has a written KM policy or strategy	11.8	22.1	66.2
B	has a value system or culture intended to promote knowledge sharing	29.0	39.1	31.9
C	has policies or programs intended to improve employee retention	22.5	39.4	38.0
D	uses partnerships or strategic alliances to acquire knowledge	68.6	14.3	17.1
	Leadership In the HEI KM practices are:	28.9	27.0	44.2
E	a responsibility of managers and executives	44.9	13.0	42.0
F	a responsibility of non-management employees	22.4	31.3	46.3
G	a responsibility of the knowledge officer or KM unit	18.5	33.8	47.7
H	explicit criteria for assessing employee performance	29.7	29.7	40.6
	Incentives The HEI specifically rewards knowledge sharing with:	12.3	63.1	24.6
I	monetary incentives	7.2	71.0	21.7
J	non-monetary incentives	17.4	55.1	27.5
	Knowledge capture and acquisition The HEI regularly:	42.4	27.0	30.6
K	captures and uses knowledge obtained from other research institutes including universities and government agencies	45.5	22.7	31.8
L	dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	31.8	30.3	37.9
M	encourages employees to participate in project teams with external experts	50.0	27.9	22.1
	Training and Mentoring The HEI:	34.7	34.3	31.0
N	provides formal training related to KM practices	18.8	50.7	30.4
O	provides informal training related to KM practices	20.3	43.5	36.2
P	uses formal mentoring practices, including apprenticeships	16.7	39.4	43.9
Q	encourages experienced employees to transfer their knowledge to new or less experienced employees	38.2	38.2	23.5
R	encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	63.2	11.8	25.0
S	offers training to employees in order to keep skills current	50.7	22.4	26.9
	Communications In the HEI employees share knowledge / information by:	19.4	43.9	36.7
T	regularly updating databases of good work practices, lessons learned or listings of experts	9.5	52.4	38.1
U	preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	33.3	39.4	27.3
V	facilitating collaborative work by project teams that are physically separated ("virtual teams")	15.4	40.0	44.6
	Overall Average	30.2	34.9	34.9

Table 22. Importance of KM Practices

Importance of KM Practices N range: 55-70; N average: 65.7	Not at all important %	Somewhat important %	Important %	Critical %
Policies and Strategies The HEI:	2.5	10.1	51.3	36.0
has a written KM policy or strategy	2.9	14.7	54.4	27.9
has a value system or culture intended to promote knowledge sharing	2.9	8.7	53.6	34.8
has policies or programs intended to improve employee retention	2.9	7.1	44.3	45.7
uses partnerships or strategic alliances to acquire knowledge	1.4	10.0	52.9	35.7
Leadership In the HEI KM practices are:	4.8	20.5	58.4	16.2
a responsibility of managers and executives	3.1	15.6	62.5	18.8
a responsibility of non-management employees	6.3	20.6	63.5	9.5
a responsibility of the knowledge officer or KM unit	3.6	23.6	60.0	12.7
explicit criteria for assessing employee performance	6.3	22.2	47.6	23.8
Incentives The HEI specifically rewards knowledge sharing with:	8.1	25.7	42.7	23.6
monetary incentives	8.8	27.9	38.2	25.0
non-monetary incentives	7.4	23.5	47.1	22.1
Knowledge capture and acquisition The HEI regularly:	2.5	16.0	58.5	23.0
captures and uses knowledge obtained from other research institutes including universities and government agencies	1.5	17.6	55.9	25.0
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	3.1	21.5	55.4	20.0
encourages employees to participate in project teams with external experts	3.0	9.0	64.2	23.9
Training and Mentoring The HEI:	2.5	14.7	60.8	22.0
provides formal training related to KM practices	2.9	19.1	55.9	22.1
provides informal training related to KM practices	2.9	23.5	61.8	11.8
uses formal mentoring practices, including apprenticeships	3.2	24.2	62.9	9.7
encourages experienced employees to transfer their knowledge to new or less experienced employees	1.5	7.7	61.5	29.2
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	3.0	9.1	63.6	24.2
offers training to employees in order to keep skills current	1.5	4.5	59.1	34.8
Communications In the HEI employees share knowledge / information by:	2.6	17.6	65.2	14.6
regularly updating databases of good work practices, lessons learned or listings of experts	1.6	11.3	72.6	14.5
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	3.1	16.9	63.1	16.9
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	3.1	24.6	60.0	12.3

Table 23. KM Projects Available in the HEI (Sorted list)

KM Projects available in the HEI (Sorted list) N: 85	%
An intranet for faculty	95.3
An intranet for students	94.1
A wireless network around the university	74.1
Online forums, email lists, web-based communities and/or chat rooms to encourage the creation of virtual communities of practice	58.8
Community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among students	42.4
Community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among faculty	42.4
Robust connectivity to: the intranet, knowledge repository, and/or communities of practices including real time expert contact	41.2
A document management system (DMS)	30.6
Real time expert contact	28.2
Internal networks of knowledge employees	25.9
A portal that supports collaboration, knowledge sharing and document management	23.5
Knowledge repositories	23.5
Decision support tools	23.5
Data warehouses	21.2
Designated knowledge support officers who assist in creating, editing and translating knowledge assets	15.3
Community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among non-faculty	15.3
The content of the DMS is frequently checked to ensure quality by filtering out irrelevant, unsolicited and expired contributions	14.1
The content of the DMS is supplemented by meta-content like directories, search engines and indexing	12.9
Groupware to support collaboration	10.6
An intranet for non-faculty	9.4
Other	8.2

Table 24. Reasons for KM Practices' Usage in the HEI

Reasons for KM practices' usage in the HEI N range: 22-66; N average: 62.4	Not at all important %	Somewhat important %	Important %	Critical %
To improve the competitive advantage of the HEI	1.5	10.6	47.0	40.9
To help integrate knowledge within the HEI	3.0	7.6	42.4	47.0
To improve the capture and use of knowledge from sources outside the HEI	1.5	7.6	54.5	36.4
To improve sharing or transferring of knowledge with partners in strategic alliances, joint ventures or consortia	0	15.2	53.0	31.8
To increase efficiency by using knowledge to improve the end-user service and product	1.5	9.2	46.2	43.1
To protect the HEI from loss of knowledge due to employees' departures	1.6	12.5	37.5	48.4
To train employees to meet strategic objectives of the HEI	0	12.3	50.8	36.9
To increase employee acceptance of innovations	0	7.6	56.1	36.4
To improve employee retention	3.1	9.4	45.3	42.2
To identify and/or to protect strategic knowledge present in the HEI	3.0	9.1	53.0	34.8
To capture employees' undocumented knowledge (know-how)	1.6	17.2	48.4	32.8
To ease collaborative work of projects or teams that are physically separated	3.2	17.5	58.7	20.6
To promote sharing or transferring knowledge with stakeholders	4.6	10.8	63.1	21.5
To relieve information overload problems within the HEI	4.6	26.2	38.5	30.8
To catch-up with competitors' use of KM tools or practices	3.1	12.3	53.8	30.8
Other	27.3	18.2	50.0	4.5

Table 25. Results of Using KM Practices in the HEI

Results of Using KM Practices in the HEI N range: 53-58; N average: 56.0 Using KM Practices:	Not at all effective %	Somewhat effective %	Effective %	Very Effective %
increased our knowledge sharing horizontally (across departments, functions or business units)	19.0	37.9	34.5	8.6
increased our knowledge sharing vertically (up the organizational hierarchy)	20.0	38.2	34.5	7.3
improved employee efficiency and / or productivity	15.5	29.3	46.6	8.6
improved skills and knowledge of employees	12.3	31.6	47.4	8.8
increased our number of markets (more geographic locations)	25.5	40.0	27.3	7.3
improved stakeholder relations	21.8	43.6	32.7	1.8
helped us add new products or services	21.4	32.1	39.3	7.1
increased our adaptation of products or services to stakeholder requirements	20.8	37.7	39.6	1.9
increased flexibility in product delivery and innovation	17.5	38.6	38.6	5.3
prevented duplicate research	23.2	37.5	33.9	5.4
improved our corporate or organizational memory	17.9	39.3	37.5	5.4
increased our ability to capture knowledge from public research institutions including universities and government agencies	16.1	35.7	41.1	7.1
increased our ability to capture knowledge from other business enterprises, industrial associations, technical literature, etc.	14.3	41.1	41.1	3.6
improved involvement of employees in the workplace activities	16.1	39.3	41.1	3.6

Table 26. Groups Responsible for KM Practices (Sorted list)

Groups Responsible for KM Practices (Sorted list) N:85	%
Don't know	31.8
Department / School	27.1
Human Resources	23.5
Information Technology	22.4
Library	22.4
Executive Management Team (direct responsibility)	20.0
Distance Learning Unit	18.8
Knowledge Management Unit	11.8
Documentation Centre	7.1
Nobody	7.1
Other	2.4

Table 27. Learning Practices in Use within the HEI

Code	Learning Practices In Use Within the HEI N range: 55-61; N average: 57.9	Never %	Sometimes %	Often %	Always %
	Individual Level In the HEI employees:	12.1	56.8	28.0	3.1
A	openly discuss experiences in order to learn from them	3.3	60.0	33.3	3.3
B	identify skills needed for future work tasks	8.5	55.9	32.2	3.4
C	help each other learn	5.2	53.4	34.5	6.9
D	can get money and other resources to support their learning	10.3	72.4	13.8	3.4
E	can get time off to support learning	29.3	44.8	24.1	1.7
F	view problems and new directives as an opportunity to learn	12.1	63.8	24.1	0.0
G	are rewarded for learning	36.8	50.9	10.5	1.8
H	give open and honest feedback to each other	6.8	59.3	32.2	1.7
I	listen to others' views before speaking	5.1	62.7	32.2	0.0
J	are encouraged to state their opinion regardless of rank	13.6	50.8	28.8	6.8
K	treat each other with respect	5.1	44.1	44.1	6.8
L	spend time building trust with each other	8.8	63.2	26.3	1.8
	Team or Group Level In the HEI teams/groups:	13.6	51.4	32.2	2.7
M	have the freedom to adapt their goals as needed	8.5	50.8	40.7	0.0
N	treat members as equals, regardless of rank, culture, or other differences	10.0	38.3	43.3	8.3
O	focus both on the group's task and on how well the group is working	7.1	60.7	32.1	0.0
P	revise their thinking as a result of group discussions or information collected	8.6	51.7	36.2	3.4
Q	are rewarded for their achievements as a team/group	33.9	55.4	8.9	1.8
	Organizational Level The HEI:	20.0	49.2	26.1	4.7
R	uses two-way communication, such as suggestion systems, electronic communication, open meetings, etc., on a regular basis	15.0	40.0	36.7	8.3
S	enables its people to get needed information at any time quickly and easily	3.3	52.5	36.1	8.2
T	maintains an up-to-date database of employee skills	35.7	35.7	26.8	1.8
U	creates systems to measure gaps between current and expected performance	30.9	47.3	20.0	1.8
V	shares good-practices and lessons-learned among all employees	24.1	58.6	15.5	1.7
W	measures the results of the time and resources spent on learning	41.8	41.8	12.7	3.6
X	invites people to contribute to the organization's vision	15.8	42.1	35.1	7.0
Y	gives people control over the resources they need to accomplish their work	13.8	62.1	22.4	1.7
Z	considers the impact of decisions on employee morale	28.8	50.8	16.9	3.4
AA	works together with the outside community to meet mutual needs	10.5	52.6	35.1	1.8
AB	encourages people to get answers from across the organization when solving problems	11.9	50.8	32.2	5.1
AC	leaders generally support requests for learning opportunities and training	3.6	58.2	30.9	7.3
AD	leaders share up-to-date information with employees about competitors, industry trends, and organizational directions	18.6	52.5	22.0	6.8
AE	leaders empower others to help carry out the organization's vision	19.0	56.9	19.0	5.2
AF	leaders mentor and coach those they lead	27.6	41.4	25.9	5.2
AG	leaders ensure that the organization's actions are consistent with its values	19.3	43.9	29.8	7.0
	Overall Average	16.1	52.3	27.7	3.8

Student Survey

Table 28. KM Projects Available in the HEI (Students' Survey)

KM Projects available in the HEI (Students' Survey) N range: 55-61 ; N average: 58	Yes %	No %	Don't know %
An intranet for students	88.5	6.6	4.9
A portal that supports collaboration, knowledge sharing and document management	58.6	12.1	29.3
Community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among students	45.6	21.1	33.3
Community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among students and faculty	47.3	20.0	32.7
Online forums, email lists, web-based communities and/or chat rooms to encourage the creation of virtual communities of practice	61.8	9.1	29.1
Real time expert contact	52.6	24.6	22.8
A wireless network around the university	82.8	12.1	5.2
Groupware to support collaboration	27.6	20.7	51.7
Social media	60.3	12.1	27.6
Mobile content and apps	79.3	8.6	12.1

Table 29. Importance of KM Projects (Students' Survey)

Importance of KM Projects (Students' Survey) N range: 51-60 ; N average: 55.5	Not at all important %	Somewhat important %	Important %	Critical %
An intranet for students	3.3	16.7	66.7	13.3
A portal that supports collaboration, knowledge sharing and document management	1.8	28.6	62.5	7.1
Community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among students	7.8	35.3	52.9	3.9
Community(ies) of practice(s) such as learning networks, thematic groups and/or special interest groups among students and faculty	9.1	30.9	54.5	5.5
Online forums, email lists, web-based communities and/or chat rooms to encourage the creation of virtual communities of practice	3.7	27.8	63.0	5.6
Real time expert contact	3.7	46.3	37.0	13.0
A wireless network around the university	3.5	8.8	50.9	36.8
Groupware to support collaboration	7.3	41.8	47.3	3.6
Social media	3.5	40.4	54.4	1.8
Mobile content and apps	7.0	29.8	52.6	10.5

Table 30. KM Practices in Use within the HEI (Students' Survey)

KM Practices in Use within the HEI (Students' Survey) N range:56-58; N average:57	Yes %	No %	Don't know %
The university organizes or holds conferences, trade shows, seminars, educational summits, training sessions, and/or panel discussions for students	77.6	12.1	10.3
Students share a sense of direction, excitement, trust (that information received will be the best), and willingness to continually learn from others	42.1	19.3	38.6
Students share knowledge/information by regularly updating databases of good practices, lessons learned, etc.	45.6	22.8	31.6
There exists within the university continuous quest for knowledge especially among all students	53.4	19.0	27.6
The university dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	50.8	16.9	32.2
The employees and/or students within the university practice knowledge sharing	59.3	18.6	22.0
Other	26.8	30.4	42.9
Overall Average	50.8	19.9	29.3

Table 31. Importance of KM Practices (Students' Survey)

Table 24. Importance of KM Practices (Students' Survey) N range:53-58; N average:55.5	Not at all important %	Somewhat important %	Important %	Critical %
The university organizes or holds conferences, trade shows, seminars, educational summits, training sessions, and/or panel discussions for students	5.2	24.1	60.3	10.3
Students share a sense of direction, excitement, trust (that information received will be the best), and willingness to continually learn from others	8.9	35.7	48.2	7.1
Students share knowledge/information by regularly updating databases of good practices, lessons learned, etc.	7.5	39.6	45.3	7.5
There exists within the university continuous quest for knowledge especially among all students	7.5	35.8	43.4	13.2
The university dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	5.4	28.6	60.7	5.4
The employees and/or students within the university practice knowledge sharing	3.4	29.3	58.6	8.6
Overall Average	6.3	32.2	52.8	8.7

Additional Tables

Employee Survey

KM Practices in Use

Table 32. KM Practices in Use by School (Population Analysis)

KM Practices in Use by School – Population (N) Analysis	N Range	N Average	% of total population
School of Business	13-16	15.1	25.6
School of Education	4-5	5.0	8.5
School of Humanities, Social Sciences and Law	14-17	16.2	27.5
School of Sciences and Engineering	20-24	22.6	38.4

Table 33. KM Practices in Use by School

KM practices in use by school	Business %	Education %	Humanities, Social Sciences and Law %	Sciences and Engineering %
Policies and Strategies The HEI:	36.2	40.0	34.2	28.8
has a written KM policy or strategy	13.3	20.0	17.6	8.7
has a value system or culture intended to promote knowledge sharing	18.8	40.0	25.0	29.2
has policies or programs intended to improve employee retention	25.0	40.0	17.6	20.8
uses partnerships or strategic alliances to acquire knowledge	87.5	60.0	76.5	56.5
Leadership In the HEI KM practices are:	31.8	5.0	39.9	26.5
a responsibility of managers and executives	43.8	0.0	47.1	54.5
a responsibility of non-management employees	33.3	0.0	31.3	13.6
a responsibility of the knowledge officer or KM unit	14.3	0.0	31.3	22.7
explicit criteria for assessing employee performance	35.7	20.0	50.0	15.0
Incentives The HEI specifically rewards knowledge sharing with:	6.5	60.0	11.8	8.7
monetary incentives	0.0	40.0	5.9	8.7
non-monetary incentives	13.3	80.0	17.6	8.7
Knowledge capture and acquisition The HEI regularly:	52.2	58.3	47.0	29.3
captures and uses knowledge obtained from other research institutes including universities and government agencies	53.8	60.0	56.3	30.4
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	42.9	40.0	37.5	22.7
encourages employees to participate in project teams with external experts	60.0	75.0	47.1	34.8
Training and Mentoring The HEI:	37.1	40.0	31.0	34.0
provides formal training related to KM practices	0.0	20.0	17.6	34.8
provides informal training related to KM practices	26.7	40.0	11.8	21.7
uses formal mentoring practices, including apprenticeships	33.3	0.0	18.8	9.1
encourages experienced employees to transfer their knowledge to new or less experienced employees	25.0	60.0	31.3	36.4
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	75.0	60.0	60.0	56.5
offers training to employees in order to keep skills current	62.5	60.0	46.7	45.5
Communications In the HEI employees share knowledge / information by:	19.6	26.7	24.5	16.1
regularly updating databases of good work practices, lessons learned or listings of experts	14.3	20.0	0.0	13.6
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	31.3	60.0	46.7	21.7
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	13.3	0.0	26.7	13.0
Overall Average	32.9	36.1	32.7	26.3

Table 34. KM Practices in Use Combined with Total Years of Overall Work Experience (Population Analysis)

KM practices in use combined with total years of overall work experience – Population (N) Analysis	N Range	N Average	% of total population
0-2 years of work experience	1-3	2.1	3.2
3-5 years of work experience	1	1	1.5
6-9 years of work experience	8-10	9.6	14.5
10+ years of work experience	50-56	53.6	80.8

Table 35. KM Practices in Use Combined with Total Years of Overall Work Experience

KM practices in use combined with total years of overall work experience	0-2 years of experience %	3-5 years of experience %	6-9 years of experience %	10+ years of experience %
Policies and Strategies The HEI:	25.0	0.0	27.5	35.6
has a written KM policy or strategy	33.3	0.0	10.0	11.3
has a value system or culture intended to promote knowledge sharing	0.0	0.0	30.0	31.5
has policies or programs intended to improve employee retention	0.0	0.0	20.0	25.0
uses partnerships or strategic alliances to acquire knowledge	66.7	0.0	50.0	74.5
Leadership In the HEI KM practices are:	0.0	25.0	18.9	32.5
a responsibility of managers and executives	0.0	100.0	44.4	46.4
a responsibility of non-management employees	0.0	0.0	0.0	28.3
a responsibility of the knowledge officer or KM unit	0.0	0.0	11.1	21.2
explicit criteria for assessing employee performance	0.0	0.0	20.0	34.0
Incentives The HEI specifically rewards knowledge sharing with:	50.0	0.0	10.0	11.9
monetary incentives	50.0	0.0	0.0	7.3
non-monetary incentives	50.0	0.0	20.0	16.4
Knowledge capture and acquisition The HEI regularly:	33.3	0.0	37.4	45.3
captures and uses knowledge obtained from other research institutes including universities and government agencies	50.0	0.0	40.0	48.1
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	0.0	0.0	22.2	35.8
encourages employees to participate in project teams with external experts	50.0	0.0	50.0	51.9
Training and Mentoring The HEI:	33.3	16.7	31.4	35.9
provides formal training related to KM practices	0.0	0.0	20.0	20.0
provides informal training related to KM practices	50.0	0.0	10.0	21.8
uses formal mentoring practices, including apprenticeships	0.0	0.0	10.0	19.2
encourages experienced employees to transfer their knowledge to new or less experienced employees	100.0	0.0	33.3	38.2
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	0.0	100.0	77.8	61.8
offers training to employees in order to keep skills current	50.0	0.0	37.5	54.5
Communications In the HEI employees share knowledge / information by:	0.0	0.0	16.7	21.1
regularly updating databases of good work practices, lessons learned or listings of experts	0.0	0.0	0.0	12.0
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	0.0	0.0	40.0	34.0
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	0.0	0.0	10.0	17.3
Overall Average	22.7	9.1	25.3	32.3

Table 36. KM Practices in Use Combined with Total Years of Management Experience (if any) (Population Analysis)

KM practices in use combined with total years of management experience (if any) – Population (N) Analysis	N Range	N Average	% of total population
0-2 years of management experience	18-21	19.8	32.7
3-5 years of management experience	6-7	6.9	11.4
6-9 years of management experience	11-13	12.7	21.0
10+ years of management experience	19-23	21.2	35.0

Table 37. KM Practices in Use Combined with Total Years of Management Experience (if any)

KM practices in use combined with total years of management experience (if any)	0-2 years of mngt experience %	3-5 years of mngt experience %	6-9 years of mngt experience %	10+ years of mngt experience %
Policies and Strategies The HEI:	25.0	17.9	32.7	48.2
has a written KM policy or strategy	9.5	0.0	7.7	20.0
has a value system or culture intended to promote knowledge sharing	19.0	28.6	30.8	42.9
has policies or programs intended to improve employee retention	14.3	0.0	15.4	43.5
uses partnerships or strategic alliances to acquire knowledge	57.1	42.9	76.9	86.4
Leadership In the HEI KM practices are:	23.4	25.0	22.7	38.3
a responsibility of managers and executives	42.1	57.1	23.1	52.2
a responsibility of non-management employees	5.0	14.3	23.1	33.3
a responsibility of the knowledge officer or KM unit	26.3	14.3	8.3	15.0
explicit criteria for assessing employee performance	20.0	14.3	36.4	52.6
Incentives The HEI specifically rewards knowledge sharing with:	15.0	0.0	20.0	13.3
monetary incentives	5.0	0.0	15.4	9.1
non-monetary incentives	25.0	0.0	25.0	17.4
Knowledge capture and acquisition The HEI regularly:	33.3	14.3	44.9	55.8
captures and uses knowledge obtained from other research institutes including universities and government agencies	42.1	28.6	50.0	47.6
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	26.3	0.0	38.5	38.1
encourages employees to participate in project teams with external experts	31.6	14.3	46.2	81.8
Training and Mentoring The HEI:	25.0	35.3	29.7	48.2
provides formal training related to KM practices	15.0	57.1	7.7	18.2
provides informal training related to KM practices	10.0	28.6	15.4	31.8
uses formal mentoring practices, including apprenticeships	0.0	28.6	16.7	30.0
encourages experienced employees to transfer their knowledge to new or less experienced employees	25.0	14.3	30.8	59.1
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	65.0	50.0	61.5	77.3
offers training to employees in order to keep skills current	35.0	33.3	46.2	72.7
Communications In the HEI employees share knowledge / information by:	19.3	4.8	23.1	25.8
regularly updating databases of good work practices, lessons learned or listings of experts	0.0	0.0	15.4	15.8
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	47.4	0.0	46.2	30.0
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	10.5	14.3	7.7	31.6
Overall Average	24.1	20.7	31.3	43.7

Table 38. KM Practices in Use Combined with Total Years with Current Organization (Population Analysis)

KM practices in use combined with total years with current organization – Population (N) Analysis	N Range	N Average	% of total population
0-2 years of experience in current organization	6-8	7	10.7
3-5 years of management in current organization	7-8	7.9	12.1
6-9 years of management in current organization	14-15	14.6	22.3
10+ years of management in current organization	32-38	36	55.0

Table 39. KM Practices in Use Combined with Total Years with Current Organization

KM practices in use combined with total years with current organization	0-2 years of experience %	3-5 years of experience %	6-9 years of experience %	10+ years of experience %
Policies and Strategies The HEI:	34.4	44.2	23.3	35.2
has a written KM policy or strategy	12.5	14.3	13.3	11.1
has a value system or culture intended to promote knowledge sharing	25.0	62.5	20.0	27.8
has policies or programs intended to improve employee retention	25.0	12.5	6.7	31.6
uses partnerships or strategic alliances to acquire knowledge	75.0	87.5	53.3	70.3
Leadership In the HEI KM practices are:	3.6	38.0	27.7	32.7
a responsibility of managers and executives	14.3	75.0	42.9	44.7
a responsibility of non-management employees	0.0	14.3	26.7	27.8
a responsibility of the knowledge officer or KM unit	0.0	37.5	14.3	17.6
explicit criteria for assessing employee performance	0.0	25.0	26.7	40.6
Incentives The HEI specifically rewards knowledge sharing with:	28.6	18.8	10.0	9.5
monetary incentives	28.6	12.5	6.7	2.7
non-monetary incentives	28.6	25.0	13.3	16.2
Knowledge capture and acquisition The HEI regularly:	47.6	58.3	37.0	40.0
captures and uses knowledge obtained from other research institutes including universities and government agencies	57.1	62.5	46.7	40.0
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	28.6	50.0	21.4	31.4
encourages employees to participate in project teams with external experts	57.1	62.5	42.9	48.6
Training and Mentoring The HEI:	36.5	39.9	25.5	37.6
provides formal training related to KM practices	14.3	50.0	6.7	18.9
provides informal training related to KM practices	28.6	12.5	13.3	24.3
uses formal mentoring practices, including apprenticeships	0.0	14.3	20.0	20.0
encourages experienced employees to transfer their knowledge to new or less experienced employees	83.3	37.5	20.0	40.5
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	42.9	62.5	50.0	70.3
offers training to employees in order to keep skills current	50.0	62.5	42.9	51.4
Communications In the HEI employees share knowledge / information by:	27.0	25.0	11.9	19.0
regularly updating databases of good work practices, lessons learned or listings of experts	14.3	12.5	0.0	12.1
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	50.0	50.0	28.6	27.8
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	16.7	12.5	7.1	17.1
Overall Average	29.6	38.8	23.8	31.5

Table 40. KM Practices in Use Combined with Employment Terms (Population Analysis)

KM practices in use combined with employment terms – Population (N) Analysis	N Range	N Average	% of total population
Full-time	54-61	58.3	89.3
Part-time	6-8	7	10.7

Table 41. KM Practices in Use Combined with Employment Terms

KM practices in use combined with employment terms	Full-time %	Part-time %
Policies and Strategies The HEI:	31.4	50.0
has a written KM policy or strategy	10.3	25.0
has a value system or culture intended to promote knowledge sharing	27.1	50.0
has policies or programs intended to improve employee retention	21.3	37.5
uses partnerships or strategic alliances to acquire knowledge	66.7	87.5
Leadership In the HEI KM practices are:	30.6	10.7
a responsibility of managers and executives	50.0	14.3
a responsibility of non-management employees	23.7	0.0
a responsibility of the knowledge officer or KM unit	16.1	28.6
explicit criteria for assessing employee performance	32.7	0.0
Incentives The HEI specifically rewards knowledge sharing with:	10.9	28.6
monetary incentives	5.0	28.6
non-monetary incentives	16.7	28.6
Knowledge capture and acquisition The HEI regularly:	41.0	57.1
captures and uses knowledge obtained from other research institutes including universities and government agencies	43.9	57.1
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	29.8	42.9
encourages employees to participate in project teams with external experts	49.2	71.4
Training and Mentoring The HEI:	33.2	50.0
provides formal training related to KM practices	16.7	42.9
provides informal training related to KM practices	16.7	57.1
uses formal mentoring practices, including apprenticeships	17.5	0.0
encourages experienced employees to transfer their knowledge to new or less experienced employees	32.2	85.7
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	66.1	42.9
offers training to employees in order to keep skills current	50.0	71.4
Communications In the HEI employees share knowledge / information by:	18.6	31.0
regularly updating databases of good work practices, lessons learned or listings of experts	5.6	42.9
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	34.5	33.3
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	15.8	16.7
Overall Average	29.4	39.2

Table 42. KM Practices in Use Combined with Age (Population Analysis)

KM practices in use combined with age – Population (N) Analysis	N Range	N Average	% of total population
20-29 years of age	2	2	3.0
30-39 years of age	15-18	16.8	25.3
40-49 years of age	26-29	28.3	42.7
50-59 years of age	12-15	14.1	21.3
60+ years of age	4-6	5.1	7.7

Table 43. . KM Practices in Use Combined with Age

KM practices in use combined with age	20-29 %	30-39 %	40-49 %	50-59 %	60+ %
Policies and Strategies The HEI:	25.0	33.4	27.6	37.0	59.6
has a written KM policy or strategy	0.0	11.1	13.8	7.1	25.0
has a value system or culture intended to promote knowledge sharing	0.0	27.8	20.7	35.7	80.0
has policies or programs intended to improve employee retention	0.0	27.8	13.8	26.7	50.0
uses partnerships or strategic alliances to acquire knowledge	100.0	66.7	62.1	78.6	83.3
Leadership In the HEI KM practices are:	25.0	24.6	29.6	29.7	45.8
a responsibility of managers and executives	50.0	50.0	37.9	40.0	83.3
a responsibility of non-management employees	50.0	11.8	27.6	21.4	25.0
a responsibility of the knowledge officer or KM unit	0.0	18.8	14.3	28.6	25.0
explicit criteria for assessing employee performance	0.0	17.6	38.5	28.6	50.0
Incentives The HEI specifically rewards knowledge sharing with:	0.0	14.7	12.4	6.7	26.7
monetary incentives	0.0	5.9	6.9	6.7	20.0
non-monetary incentives	0.0	23.5	17.9	6.7	33.3
Knowledge capture and acquisition The HEI regularly:	66.7	43.9	35.5	45.1	67.2
captures and uses knowledge obtained from other research institutes including universities and government agencies	100.0	47.1	40.7	40.0	75.0
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	100.0	37.5	21.4	28.6	60.0
encourages employees to participate in project teams with external experts	0.0	47.1	44.4	66.7	66.7
Training and Mentoring The HEI:	33.3	29.4	32.9	37.5	56.1
provides formal training related to KM practices	0.0	11.8	17.2	26.7	40.0
provides informal training related to KM practices	0.0	5.9	27.6	26.7	20.0
uses formal mentoring practices, including apprenticeships	50.0	5.9	14.8	14.3	60.0
encourages experienced employees to transfer their knowledge to new or less experienced employees	50.0	37.5	20.7	64.3	66.7
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	50.0	68.8	65.5	50.0	66.7
offers training to employees in order to keep skills current	50.0	46.7	51.7	42.9	83.3
Communications In the HEI employees share knowledge / information by:	33.3	15.8	19.2	19.0	30.0
regularly updating databases of good work practices, lessons learned or listings of experts	0.0	6.3	11.1	15.4	0.0
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	100.0	35.3	28.6	25.0	50.0
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	0.0	5.9	17.9	16.7	40.0
Overall Average	31.8	28.0	28.0	31.7	50.2

Table 44. KM Practices in Use Combined with Gender (Population Analysis)

KM practices in use combined with gender – Population (N) Analysis	N Range	N Average	% of total population
Male	34-39	37.2	56.0
Female	27-31	29.2	44.0

Table 45. KM Practices in Use Combined with Gender

KM practices in use combined with gender	Male %	Female %
Policies and Strategies The HEI:	32.4	34.8
has a written KM policy or strategy	13.5	10.0
has a value system or culture intended to promote knowledge sharing	29.7	29.0
has policies or programs intended to improve employee retention	23.1	22.6
uses partnerships or strategic alliances to acquire knowledge	63.2	77.4
Leadership In the HEI KM practices are:	29.3	29.2
a responsibility of managers and executives	47.4	43.3
a responsibility of non-management employees	18.9	27.6
a responsibility of the knowledge officer or KM unit	17.6	20.0
explicit criteria for assessing employee performance	33.3	25.9
Incentives The HEI specifically rewards knowledge sharing with:	11.9	13.4
monetary incentives	7.9	6.7
non-monetary incentives	15.8	20.0
Knowledge capture and acquisition The HEI regularly:	35.7	52.4
captures and uses knowledge obtained from other research institutes including universities and government agencies	36.0	58.6
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	25.0	41.4
encourages employees to participate in project teams with external experts	46.2	57.1
Training and Mentoring The HEI:	36.5	33.0
provides formal training related to KM practices	21.1	16.7
provides informal training related to KM practices	31.6	6.7
uses formal mentoring practices, including apprenticeships	21.6	10.7
encourages experienced employees to transfer their knowledge to new or less experienced employees	34.2	44.8
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	65.8	58.6
offers training to employees in order to keep skills current	44.7	60.7
Communications In the HEI employees share knowledge / information by:	19.3	20.3
regularly updating databases of good work practices, lessons learned or listings of experts	11.4	7.4
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	27.0	42.9
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	19.4	10.7
Overall Average	29.7	31.8

Importance of KM Practices

Table 46. Importance of KM Practices by School (Critical/Important) (Population Analysis)

Importance of KM practices by school (Critical/Important) – Population (N) Analysis	N Range	N Average	% of total population
School of Business	13-16	14.5	26.6
School of Education	3-5	4.0	7.3
School of Humanities, Social Sciences and Law	12-17	14.5	26.6
School of Sciences and Engineering	19-24	21.5	39.4

Table 47. Importance of KM Practices by School (Critical/Important)

Importance of KM Practices by School Critical/Important	Business %	Education %	Humanities, Social Sciences and Law %	Sciences and Engineering %
Policies and Strategies The HEI:				
has a written KM policy or strategy	87.5	80.0	81.3	82.6
has a value system or culture intended to promote knowledge sharing	93.8	100.0	82.4	87.0
has policies or programs intended to improve employee retention	86.7	100.0	82.4	95.8
uses partnerships or strategic alliances to acquire knowledge	100.0	100.0	82.4	82.6
Leadership In the HEI KM practices are:				
a responsibility of managers and executives	86.7	100.0	81.3	71.4
a responsibility of non-management employees	53.3	100.0	73.3	76.2
a responsibility of the knowledge officer or KM unit	84.6	66.7	66.7	65.0
explicit criteria for assessing employee performance	66.7	75.0	68.8	68.4
Incentives The HEI specifically rewards knowledge sharing with:				
monetary incentives	68.8	80.0	53.3	60.9
non-monetary incentives	73.3	80.0	70.6	63.6
Knowledge capture and acquisition The HEI regularly:				
captures and uses knowledge obtained from other research institutes including universities and government agencies	85.7	100.0	76.5	73.9
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	73.3	100.0	73.3	72.7
encourages employees to participate in project teams with external experts	92.9	100.0	82.4	82.6
Training and Mentoring The HEI:				
provides formal training related to KM practices	81.3	60.0	66.7	82.6
provides informal training related to KM practices	80.0	60.0	68.8	73.9
uses formal mentoring practices, including apprenticeships	86.7	50.0	61.5	68.2
encourages experienced employees to transfer their knowledge to new or less experienced employees	100.0	100.0	76.9	87.0
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	93.8	100.0	71.4	86.4
offers training to employees in order to keep skills current	100.0	100.0	86.7	90.9
Communications In the HEI employees share knowledge / information by:				
regularly updating databases of good work practices, lessons learned or listings of experts	92.9	80.0	83.3	82.6
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	86.7	80.0	78.6	78.3
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	73.3	60.0	71.4	73.9

Table 48. Importance of KM Practices Combined with Total Years of Overall Work Experience (Critical/Important) (Population Analysis)

Importance of KM Practices combined with total years of overall work experience (Critical/Important) – Population (N) Analysis	N Range	N Average	% of total population
0-2 years of work experience	2-3	2.5	3.9
3-5 years of work experience	1	1	1.6
6-9 years of work experience	5-10	7.5	11.8
10+ years of work experience	49-56	52.5	82.7

Table 49. Importance of KM Practices Combined with Total Years of Overall Work Experience (Critical/Important)

Importance of KM Practices combined with total years of overall work experience (Critical/Important)	0-2 years of work experience %	3-5 years of work experience %	6-9 years of work experience %	10+ years of work experience %
Policies and Strategies The HEI:				
has a written KM policy or strategy	100.0	100.0	80.0	83.0
has a value system or culture intended to promote knowledge sharing	100.0	100.0	80.0	90.9
has policies or programs intended to improve employee retention	100.0	100.0	100.0	89.1
uses partnerships or strategic alliances to acquire knowledge	100.0	100.0	100.0	87.5
Leadership In the HEI KM practices are:				
a responsibility of managers and executives	100.0	100.0	100.0	78.8
a responsibility of non-management employees	100.0	100.0	88.9	70.0
a responsibility of the knowledge officer or KM unit	100.0	100.0	80.0	71.7
explicit criteria for assessing employee performance	100.0	100.0	88.9	68.0
Incentives The HEI specifically rewards knowledge sharing with:				
monetary incentives	100.0	100.0	70.0	61.1
non-monetary incentives	100.0	100.0	80.0	66.7
Knowledge capture and acquisition The HEI regularly:				
captures and uses knowledge obtained from other research institutes including universities and government agencies	100.0	100.0	70.0	81.5
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	100.0	100.0	77.8	73.1
encourages employees to participate in project teams with external experts	100.0	100.0	100.0	84.9
Training and Mentoring The HEI:				
provides formal training related to KM practices	100.0	100.0	100.0	74.1
provides informal training related to KM practices	100.0	100.0	100.0	68.5
uses formal mentoring practices, including apprenticeships	100.0	100.0	87.5	68.0
encourages experienced employees to transfer their knowledge to new or less experienced employees	100.0	100.0	100.0	88.5
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	100.0	100.0	87.5	87.0
offers training to employees in order to keep skills current	100.0	100.0	100.0	92.3
Communications In the HEI employees share knowledge / information by:				
regularly updating databases of good work practices, lessons learned or listings of experts	100.0	100.0	100.0	83.7
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	100.0	100.0	80.0	80.4
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	100.0	0.0	90.0	70.6

Table 50. Importance of KM Practices Combined with Total Years of Management Experience (if any) (Critical/Important) (Population Analysis)

Importance of KM Practices combined with total years of management experience (if any) (Critical/Important) – Population (N) Analysis	N Range	N Average	% of total population
0-2 years of management experience	15-21	18.0	31.9
3-5 years of management experience	5-7	6.0	10.6
6-9 years of management experience	11-13	12.0	21.2
10+ years of management experience	18-23	20.5	36.3

Table 51. Importance of KM Practices Combined with Total Years of Management Experience (if any) (Critical/Important)

Importance of KM Practices combined with total years of management experience (if any) (Critical/Important)	0-2 years of mngt experience %	3-5 years of mngt experience %	6-9 years of mngt experience %	10+ years of mngt experience %
Policies and Strategies The HEI:				
has a written KM policy or strategy	65.0	85.7	84.6	95.2
has a value system or culture intended to promote knowledge sharing	70.0	100.0	100.0	95.5
has policies or programs intended to improve employee retention	76.2	100.0	100.0	95.7
uses partnerships or strategic alliances to acquire knowledge	75.0	100.0	92.3	91.3
Leadership In the HEI KM practices are:				
a responsibility of managers and executives	75.0	83.3	92.3	77.3
a responsibility of non-management employees	64.7	100.0	69.2	76.2
a responsibility of the knowledge officer or KM unit	60.0	100.0	72.7	77.8
explicit criteria for assessing employee performance	55.6	83.3	83.3	80.0
Incentives The HEI specifically rewards knowledge sharing with:				
monetary incentives	61.1	71.4	69.2	65.2
non-monetary incentives	60.0	85.7	66.7	72.7
Knowledge capture and acquisition The HEI regularly:				
captures and uses knowledge obtained from other research institutes including universities and government agencies	60.0	100.0	91.7	86.4
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	66.7	100.0	76.9	71.4
encourages employees to participate in project teams with external experts	78.9	85.7	92.3	95.2
Training and Mentoring The HEI:				
provides formal training related to KM practices	68.4	100.0	84.6	77.3
provides informal training related to KM practices	68.4	100.0	61.5	77.3
uses formal mentoring practices, including apprenticeships	64.7	85.7	66.7	80.0
encourages experienced employees to transfer their knowledge to new or less experienced employees	88.9	100.0	84.6	90.5
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	78.9	100.0	92.3	90.9
offers training to employees in order to keep skills current	89.5	100.0	100.0	90.0
Communications In the HEI employees share knowledge / information by:				
regularly updating databases of good work practices, lessons learned or listings of experts	87.5	100.0	84.6	80.0
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	66.7	100.0	84.6	80.0
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	61.1	100.0	61.5	85.0

Table 52. Importance of KM Practices Combined with Total Years with Current Organization (Critical/Important) (Population Analysis)

Importance of KM Practices combined with total years with current organization (Critical/Important) – Population (N) Analysis	N Range	N Average	% of total population
0-2 years of experience in current organization	5-8	6.5	10.7
3-5 years of management in current organization	7-8	7.5	12.3
6-9 years of management in current organization	10-15	12.5	20.5
10+ years of management in current organization	31-38	34.5	56.6

Table 53. Importance of KM Practices Combined with Total Years with Current Organization (Critical/Important)

Importance of KM Practices combined with total years with current organization (Critical/Important)	0-2 years of experience %	3-5 years of experience %	6-9 years of experience %	10+ years of experience %
Policies and Strategies The HEI:				
has a written KM policy or strategy	100.0	100.0	73.3	83.3
has a value system or culture intended to promote knowledge sharing	100.0	87.5	93.3	89.2
has policies or programs intended to improve employee retention	100.0	100.0	86.7	86.5
uses partnerships or strategic alliances to acquire knowledge	100.0	100.0	100.0	81.6
Leadership In the HEI KM practices are:				
a responsibility of managers and executives	100.0	100.0	100.0	69.4
a responsibility of non-management employees	83.3	100.0	92.3	62.9
a responsibility of the knowledge officer or KM unit	100.0	100.0	80.0	61.3
explicit criteria for assessing employee performance	100.0	75.0	78.6	66.7
Incentives The HEI specifically rewards knowledge sharing with:				
monetary incentives	100.0	87.5	64.3	54.1
non-monetary incentives	100.0	100.0	73.3	59.5
Knowledge capture and acquisition The HEI regularly:				
captures and uses knowledge obtained from other research institutes including universities and government agencies	85.7	87.5	86.7	75.0
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	85.7	87.5	76.9	68.6
encourages employees to participate in project teams with external experts	100.0	87.5	100.0	80.6
Training and Mentoring The HEI:				
provides formal training related to KM practices	100.0	100.0	85.7	70.3
provides informal training related to KM practices	85.7	100.0	78.6	64.9
uses formal mentoring practices, including apprenticeships	100.0	87.5	71.4	63.6
encourages experienced employees to transfer their knowledge to new or less experienced employees	100.0	100.0	92.3	85.7
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	100.0	100.0	85.7	83.3
offers training to employees in order to keep skills current	100.0	100.0	100.0	88.2
Communications In the HEI employees share knowledge / information by:				
regularly updating databases of good work practices, lessons learned or listings of experts	100.0	100.0	84.6	81.8
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	100.0	87.5	78.6	76.5
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	100.0	62.5	78.6	70.6

Table 54. Importance of KM Practices Combined with Employment Terms (Critical/Important) (Population Analysis)

Importance of KM Practices combined with employment terms (Critical/Important) – Population (N) Analysis	N Range	N Average	% of total population
Full-time	47-61	54.0	89.3
Part-time	5-8	6.5	10.7

Table 55. Importance of KM Practices Combined with Employment Terms (Critical/Important)

Importance of KM Practices combined with employment terms (Critical/Important)	Full-time %	Part-time %
Policies and Strategies The HEI:		
has a written KM policy or strategy	81.4	100.0
has a value system or culture intended to promote knowledge sharing	71.7	100.0
has policies or programs intended to improve employee retention	90.0	100.0
uses partnerships or strategic alliances to acquire knowledge	88.5	100.0
Leadership In the HEI KM practices are:		
a responsibility of managers and executives	82.1	83.3
a responsibility of non-management employees	73.2	80.0
a responsibility of the knowledge officer or KM unit	72.3	83.3
explicit criteria for assessing employee performance	69.1	83.3
Incentives The HEI specifically rewards knowledge sharing with:		
monetary incentives	61.0	85.7
non-monetary incentives	67.8	85.7
Knowledge capture and acquisition The HEI regularly:		
captures and uses knowledge obtained from other research institutes including universities and government agencies	78.0	100.0
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	73.2	85.7
encourages employees to participate in project teams with external experts	86.2	100.0
Training and Mentoring The HEI:		
provides formal training related to KM practices	78.0	85.7
provides informal training related to KM practices	74.6	71.4
uses formal mentoring practices, including apprenticeships	70.4	83.3
encourages experienced employees to transfer their knowledge to new or less experienced employees	91.1	85.7
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	86.0	100.0
offers training to employees in order to keep skills current	94.7	85.7
Communications In the HEI employees share knowledge / information by:		
regularly updating databases of good work practices, lessons learned or listings of experts	86.8	85.7
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	80.4	85.7
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	73.2	71.4

Table 56. Importance of KM Practices Combined with Age (Critical/Important) (Population Analysis)

Importance of KM Practices combined with age (Critical/Important) – Population (N) Analysis	N Range	N Average	% of total population
20-29 years of age	2	2.0	3.3
30-39 years of age	12-18	15.0	24.4
40-49 years of age	23-29	26.0	42.3
50-59 years of age	12-15	13.5	22.0
60+ years of age	4-6	5.0	8.1

Table 57. Importance of KM Practices Combined with Age (Critical/Important)

Importance of KM Practices combined with age (Critical/Important)	20-29 %	30-39 %	40-49 %	50-59 %	60+ %
Policies and Strategies The HEI:					
has a written KM policy or strategy	100.0	88.2	82.8	78.6	80.0
has a value system or culture intended to promote knowledge sharing	100.0	82.4	96.6	85.7	83.3
has policies or programs intended to improve employee retention	100.0	88.9	92.9	93.3	83.3
uses partnerships or strategic alliances to acquire knowledge	100.0	88.2	93.1	86.7	83.3
Leadership In the HEI KM practices are:					
a responsibility of managers and executives	100.0	93.3	80.8	73.3	80.0
a responsibility of non-management employees	100.0	81.3	76.9	64.3	50.0
a responsibility of the knowledge officer or KM unit	100.0	83.3	78.3	58.3	60.0
explicit criteria for assessing employee performance	50.0	81.3	68.0	78.6	60.0
Incentives The HEI specifically rewards knowledge sharing with:					
monetary incentives	50.0	75.0	64.3	60.0	50.0
non-monetary incentives	100.0	76.5	67.9	66.7	60.0
Knowledge capture and acquisition The HEI regularly:					
captures and uses knowledge obtained from other research institutes including universities and government agencies	100.0	76.5	85.7	73.3	80.0
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	100.0	75.0	74.1	69.2	83.3
encourages employees to participate in project teams with external experts	100.0	88.2	92.6	80.0	80.0
Training and Mentoring The HEI:					
provides formal training related to KM practices	100.0	88.2	82.1	71.4	50.0
provides informal training related to KM practices	100.0	82.4	78.6	66.7	40.0
uses formal mentoring practices, including apprenticeships	100.0	78.6	69.2	61.5	83.3
encourages experienced employees to transfer their knowledge to new or less experienced employees	100.0	86.7	96.4	85.7	80.0
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	100.0	78.6	93.1	85.7	83.3
offers training to employees in order to keep skills current	100.0	93.8	100.0	85.7	80.0
Communications In the HEI employees share knowledge / information by:					
regularly updating databases of good work practices, lessons learned or listings of experts	100.0	93.3	88.9	69.2	100.0
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	100.0	87.5	85.7	69.2	60.0
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	100.0	75.0	78.6	53.8	80.0

Table 58. Importance of KM Practices Combined with Gender (Critical/Important) (Population Analysis)

Importance of KM Practices combined with gender (Critical/Important) – Population (N) Analysis	N Range	N Average	% of total population
Male	31-39	35.0	56.9
Female	23-30	26.5	43.1

Table 59. Importance of KM Practices Combined with Gender (Critical/Important)

Importance of KM Practices combined with gender (Critical/ Important)	Male %	Female %
Policies and Strategies The HEI:		
has a written KM policy or strategy	75.7	93.3
has a value system or culture intended to promote knowledge sharing	89.5	90.0
has policies or programs intended to improve employee retention	92.3	90.0
uses partnerships or strategic alliances to acquire knowledge	89.7	90.0
Leadership In the HEI KM practices are:		
a responsibility of managers and executives	75.0	92.6
a responsibility of non-management employees	69.4	80.8
a responsibility of the knowledge officer or KM unit	61.3	91.3
explicit criteria for assessing employee performance	72.2	73.1
Incentives The HEI specifically rewards knowledge sharing with:		
monetary incentives	61.5	67.9
non-monetary incentives	68.4	72.4
Knowledge capture and acquisition The HEI regularly:		
captures and uses knowledge obtained from other research institutes including universities and government agencies	75.7	86.7
dedicates resources to detecting and obtaining external knowledge and communicating it within the organization	69.4	82.1
encourages employees to participate in project teams with external experts	86.8	89.3
Training and Mentoring The HEI:		
provides formal training related to KM practices	73.7	86.2
provides informal training related to KM practices	65.8	86.2
uses formal mentoring practices, including apprenticeships	69.4	76.0
encourages experienced employees to transfer their knowledge to new or less experienced employees	89.2	92.6
encourages employees to continue their education by reimbursing tuition fees for successfully completed work-related courses	81.6	96.3
offers training to employees in order to keep skills current	91.9	96.4
Communications In the HEI employees share knowledge / information by:		
regularly updating databases of good work practices, lessons learned or listings of experts	80.8	96.2
preparing written documentation such as lessons learned, training manuals, good work practises, articles for publication, etc. (organizational memory)	72.2	92.9
facilitating collaborative work by project teams that are physically separated (“virtual teams”)	63.9	85.7

Learning Practices in Use

Table 60. Learning Practices in Use within the HEI by School (Often/Always) (Population Analysis)

Learning Practices In Use Within the HEI by School (Often/Always) – Population (N) Analysis	N Range	N Average	% of total population
School of Business	13-15	14.0	28.3
School of Education	2-4	3.0	6.1
School of Humanities, Social Sciences and Law	11-13	12.0	24.2
School of Sciences and Engineering	20-21	20.5	41.4

Table 61. Learning Practices in Use within the HEI by School (Often/Always)

Learning Practices In Use Within the HEI by School (Often/Always)	Business %	Education %	Humanities, Social Sciences and Law %	Sciences and Engineering %
Individual Level In the HEI employees:	25.2	52.8	24.8	33.9
openly discuss experiences in order to learn from them	26.7	75.0	30.8	38.1
identify skills needed for future work tasks	46.7	25.0	15.4	35.0
help each other learn	28.6	50.0	53.8	42.9
can get money and other resources to support their learning	7.1	33.3	23.1	14.3
can get time off to support learning	26.7	50.0	30.8	28.6
view problems and new directives as an opportunity to learn	14.3	50.0	30.8	25.0
are rewarded for learning	14.3	50.0	7.7	14.3
give open and honest feedback to each other	21.4	50.0	16.7	42.9
listen to others' views before speaking	20.0	50.0	25.0	35.0
are encouraged to state their opinion regardless of rank	46.7	75.0	8.3	38.1
treat each other with respect	35.7	100.0	38.5	52.4
spend time building trust with each other	14.3	25.0	16.7	40.0
Team or Group Level In the HEI teams/groups:	42.0	65.0	15.7	34.7
have the freedom to adapt their goals as needed	42.9	75.0	23.1	38.1
treat members as equals, regardless of rank, culture, or other differences	60.0	66.7	30.8	52.4
focus both on the group's task and on how well the group is working	35.7	66.7	9.1	28.6
revise their thinking as a result of group discussions or information collected	57.1	66.7	15.4	40.0
are rewarded for their achievements as a team/group	14.3	50.0	0.0	14.3
Organizational Level The HEI:	30.5	77.6	20.5	28.9
uses two-way communication, such as suggestion systems, electronic communication, open meetings, etc., on a regular basis	40.0	100.0	23.1	47.6
enables its people to get needed information at any time quickly and easily	33.3	100.0	30.8	47.6
maintains an up-to-date database of employee skills	28.6	100.0	16.7	23.8
creates systems to measure gaps between current and expected performance	35.7	50.0	8.3	9.5
shares good-practices and lessons-learned among all employees	7.1	66.7	7.7	19.0
measures the results of the time and resources spent on learning	15.4	66.7	7.7	14.3
invites people to contribute to the organization's vision	42.9	75.0	25.0	40.0
gives people control over the resources they need to accomplish their work	15.4	75.0	16.7	28.6
considers the impact of decisions on employee morale	20.0	33.3	15.4	19.0
works together with the outside community to meet mutual needs	57.1	75.0	16.7	30.0
encourages people to get answers from across the organization when solving problems	35.7	100.0	33.3	23.8
leaders generally support requests for learning opportunities and training	38.5	100.0	16.7	45.0
leaders share up-to-date information with employees about competitors, industry trends, and organizational directions	40.0	100.0	15.4	23.8
leaders empower others to help carry out the organization's vision	7.1	66.7	30.8	28.6
leaders mentor and coach those they lead	28.6	66.7	30.8	28.6
leaders ensure that the organization's actions are consistent with its values	42.9	66.7	33.3	33.3

Table 62. Learning Practices in Use Combined with Total Years of Overall Work Experience (Often/Always) (Population Analysis)

Learning practices in use combined with total years of overall work experience **Often/Always – Population (N) Analysis**	N Range	N Average	% of total population
0-2 years of work experience	0-2	1.0	1.8
3-5 years of work experience	0-1	0.5	0.9
6-9 years of work experience	8-9	8.5	14.9
10+ years of work experience	45-49	47.0	82.5

Table 63. Learning Practices in Use Combined with Total Years of Overall Work Experience (Often/Always)

Learning practices in use combined with total years of overall work experience Often/Always	0-2 years of experience %	3-5 years of experience %	6-9 years of experience %	10+ years of experience %
Individual Level In the HEI employees:	33.3	41.7	22.3	32.8
openly discuss experiences in order to learn from them	100.0	0.0	0.0	42.9
identify skills needed for future work tasks	100.0	100.0	33.3	39.6
help each other learn	0.0	100.0	33.3	42.6
can get money and other resources to support their learning	0.0	0.0	11.1	18.8
can get time off to support learning	0.0	0.0	12.5	28.6
view problems and new directives as an opportunity to learn	0.0	0.0	22.2	25.0
are rewarded for learning	0.0	0.0	0.0	14.6
give open and honest feedback to each other	50.0	100.0	22.2	34.0
listen to others' views before speaking	50.0	100.0	33.3	29.8
are encouraged to state their opinion regardless of rank	0.0	0.0	22.2	39.6
treat each other with respect	100.0	0.0	55.6	50.0
spend time building trust with each other	0.0	100.0	22.2	28.3
Team or Group Level In the HEI teams/groups:	20.0	0.0	34.4	36.0
have the freedom to adapt their goals as needed	0.0	0.0	44.4	41.7
treat members as equals, regardless of rank, culture, or other differences	100.0	0.0	55.6	51.0
focus both on the group's task and on how well the group is working	0.0	0.0	22.2	34.8
revise their thinking as a result of group discussions or information collected	0.0	0.0	37.5	41.7
are rewarded for their achievements as a team/group	0.0	0.0	12.5	10.6
Organizational Level The HEI:	18.8	0.0	29.3	31.5
uses two-way communication, such as suggestion systems, electronic communication, open meetings, etc., on a regular basis	100.0	0.0	33.3	46.9
enables its people to get needed information at any time quickly and easily	50.0	0.0	55.6	42.9
maintains an up-to-date database of employee skills	0.0	0.0	25.0	29.8
creates systems to measure gaps between current and expected performance	0.0	0.0	12.5	23.9
shares good-practices and lessons-learned among all employees	0.0	0.0	22.2	16.7
measures the results of the time and resources spent on learning	0.0	0.0	22.2	15.6
invites people to contribute to the organization's vision	0.0	0.0	37.5	44.7
gives people control over the resources they need to accomplish their work	50.0	0.0	33.3	21.7
considers the impact of decisions on employee morale	0.0	0.0	22.2	20.4
works together with the outside community to meet mutual needs	0.0	0.0	22.2	41.3
encourages people to get answers from across the organization when solving problems	100.0	0.0	33.3	36.2
leaders generally support requests for learning opportunities and training	0.0	0.0	33.3	40.0
leaders share up-to-date information with employees about competitors, industry trends, and organizational directions	0.0	0.0	12.5	32.7
leaders empower others to help carry out the organization's vision	0.0	0.0	33.3	22.9
leaders mentor and coach those they lead	0.0	0.0	33.3	37.5
leaders ensure that the organization's actions are consistent with its values	0.0	0.0	31.3	37.5

Table 64. Learning Practices in Use Combined with Total Years of Management Experience (if any) (Often/Always) (Population Analysis)

Learning practices in use combined with total years of management experience (if any) **Often/Always – Population (N) Analysis**	N Range	N Average	% of total population
0-2 years of management experience	12-16	14.0	27.5
3-5 years of management experience	5-6	5.5	10.8
6-9 years of management experience	12-13	12.5	24.5
10+ years of management experience	17-21	19.0	37.3

Table 65. Learning Practices in Use Combined with Total Years of Management Experience (if any) (Often/Always)

Learning practices in use combined with total years of management experience (if any) Often/Always	0-2 years of mngt experience %	3-5 years of mngt experience %	6-9 years of mngt experience %	10+ years of mngt experience %
Individual Level In the HEI employees:	19.4	20.8	21.8	51.8
openly discuss experiences in order to learn from them	6.3	33.3	46.2	55.0
identify skills needed for future work tasks	18.8	50.0	30.8	47.4
help each other learn	31.3	16.7	23.1	66.7
can get money and other resources to support their learning	0.0	16.7	7.7	36.8
can get time off to support learning	7.1	0.0	15.4	55.0
view problems and new directives as an opportunity to learn	20.0	0.0	23.1	36.8
are rewarded for learning	0.0	16.7	7.7	26.3
give open and honest feedback to each other	18.8	16.7	23.1	63.2
listen to others' views before speaking	25.0	16.7	15.4	57.9
are encouraged to state their opinion regardless of rank	18.8	16.7	46.2	52.6
treat each other with respect	62.5	50.0	23.1	68.4
spend time building trust with each other	25.0	16.7	0.0	55.6
Team or Group Level In the HEI teams/groups:	25.1	16.7	23.5	57.7
have the freedom to adapt their goals as needed	25.0	33.3	30.8	68.4
treat members as equals, regardless of rank, culture, or other differences	40.0	50.0	38.5	76.2
focus both on the group's task and on how well the group is working	20.0	0.0	15.4	61.1
revise their thinking as a result of group discussions or information collected	33.3	0.0	25.0	61.9
are rewarded for their achievements as a team/group	7.1	0.0	7.7	21.1
Organizational Level The HEI:	24.4	9.4	24.5	50.2
uses two-way communication, such as suggestion systems, electronic communication, open meetings, etc., on a regular basis	37.5	33.3	30.8	70.0
enables its people to get needed information at any time quickly and easily	43.8	50.0	30.8	57.1
maintains an up-to-date database of employee skills	14.3	33.3	23.1	38.9
creates systems to measure gaps between current and expected performance	8.3	0.0	23.1	42.1
shares good-practices and lessons-learned among all employees	13.3	0.0	7.7	36.8
measures the results of the time and resources spent on learning	14.3	0.0	15.4	22.2
invites people to contribute to the organization's vision	33.3	16.7	38.5	63.2
gives people control over the resources they need to accomplish their work	33.3	0.0	7.7	42.1
considers the impact of decisions on employee morale	13.3	0.0	7.7	45.0
works together with the outside community to meet mutual needs	18.8	0.0	46.2	61.1
encourages people to get answers from across the organization when solving problems	37.5	0.0	30.8	55.5
leaders generally support requests for learning opportunities and training	35.7	0.0	30.8	64.7
leaders share up-to-date information with employees about competitors, industry trends, and organizational directions	7.1	0.0	38.5	52.4
leaders empower others to help carry out the organization's vision	26.7	0.0	15.4	36.8
leaders mentor and coach those they lead	26.7	16.7	23.1	52.6
leaders ensure that the organization's actions are consistent with its values	26.7	0.0	23.1	63.2

Table 66. Learning Practices in Use Combined with Total Years with Current Organization (Often/Always) (Population Analysis)

Learning practices in use combined with total years with current organization **Often/Always – Population (N) Analysis**	N Range	N Average	% of total population
0-2 years of experience in current organization	4-7	5.5	9.8
3-5 years of management in current organization	5-6	5.5	9.8
6-9 years of management in current organization	11-12	11.5	20.5
10+ years of management in current organization	32-35	33.5	59.8

Table 67. Learning Practices in Use Combined with Total Years with Current Organization (Often/Always)

Learning practices in use combined with total years with current organization Often/Always	0-2 years of experience %	3-5 years of experience %	6-9 years of experience %	10+ years of experience %
Individual Level In the HEI employees:	38.7	33.9	26.4	31.6
openly discuss experiences in order to learn from them	33.3	33.3	25.0	42.9
identify skills needed for future work tasks	16.7	40.0	33.3	37.1
help each other learn	66.7	50.0	25.0	42.4
can get money and other resources to support their learning	20.0	33.3	25.0	11.8
can get time off to support learning	50.0	16.7	33.3	22.9
view problems and new directives as an opportunity to learn	33.3	20.0	16.7	23.5
are rewarded for learning	25.0	16.7	8.3	11.8
give open and honest feedback to each other	28.6	50.0	33.3	33.3
listen to others' views before speaking	57.1	40.0	16.7	32.4
are encouraged to state their opinion regardless of rank	50.0	33.3	25.0	38.2
treat each other with respect	66.7	33.3	58.3	50.0
spend time building trust with each other	16.7	40.0	16.7	33.3
Team or Group Level In the HEI teams/groups:	51.7	40.0	30.0	34.1
have the freedom to adapt their goals as needed	66.7	33.3	41.7	38.2
treat members as equals, regardless of rank, culture, or other differences	66.7	33.3	41.7	57.1
focus both on the group's task and on how well the group is working	40.0	66.7	25.0	28.1
revise their thinking as a result of group discussions or information collected	60.0	50.0	25.0	41.2
are rewarded for their achievements as a team/group	25.0	16.7	16.7	6.1
Organizational Level The HEI:	49.9	31.5	24.3	30.4
uses two-way communication, such as suggestion systems, electronic communication, open meetings, etc., on a regular basis	66.7	50.0	33.3	45.7
enables its people to get needed information at any time quickly and easily	57.1	50.0	50.0	40.0
maintains an up-to-date database of employee skills	25.0	16.7	41.7	27.3
creates systems to measure gaps between current and expected performance	25.0	16.7	18.2	23.5
shares good-practices and lessons-learned among all employees	40.0	16.7	8.3	17.6
measures the results of the time and resources spent on learning	40.0	33.3	8.3	12.5
invites people to contribute to the organization's vision	66.7	66.7	27.3	39.4
gives people control over the resources they need to accomplish their work	57.1	16.7	16.7	21.2
considers the impact of decisions on employee morale	40.0	16.7	8.3	22.9
works together with the outside community to meet mutual needs	50.0	20.0	33.3	39.4
encourages people to get answers from across the organization when solving problems	71.4	16.7	41.7	33.3
leaders generally support requests for learning opportunities and training	60.0	66.7	25.0	34.4
leaders share up-to-date information with employees about competitors, industry trends, and organizational directions	20.0	16.7	25.0	34.3
leaders empower others to help carry out the organization's vision	60.0	33.3	8.3	23.5
leaders mentor and coach those they lead	60.0	16.7	16.7	35.3
leaders ensure that the organization's actions are consistent with its values	60.0	50.0	27.3	35.3

Table 68. Learning Practices in Use Combined with Employment Terms (Often/Always) (Population Analysis)

Learning practices in use combined with employment terms Often/ Always – Population (N) Analysis	N Range	N Average	% of total population
Full-time	49-53	51.0	90.3
Part-time	4-7	5.5	9.7

Table 69. Learning Practices in Use Combined with Employment Terms (Often/Always)

Learning practices in use combined with employment terms Often/Always	Full-time %	Part-time %
Individual Level In the HEI employees:	29.8	48.2
openly discuss experiences in order to learn from them	35.8	50.0
identify skills needed for future work tasks	36.5	33.3
help each other learn	41.2	50.0
can get money and other resources to support their learning	17.3	20.0
can get time off to support learning	24.5	50.0
view problems and new directives as an opportunity to learn	21.6	50.0
are rewarded for learning	11.5	25.0
give open and honest feedback to each other	33.3	42.9
listen to others' views before speaking	29.4	57.1
are encouraged to state their opinion regardless of rank	32.7	66.7
treat each other with respect	48.1	83.3
spend time building trust with each other	26.0	50.0
Team or Group Level In the HEI teams/groups:	32.9	60.3
have the freedom to adapt their goals as needed	36.5	83.3
treat members as equals, regardless of rank, culture, or other differences	49.1	83.3
focus both on the group's task and on how well the group is working	30.0	60.0
revise their thinking as a result of group discussions or information collected	39.2	50.0
are rewarded for their achievements as a team/group	9.8	25.0
Organizational Level The HEI:	27.8	59.3
uses two-way communication, such as suggestion systems, electronic communication, open meetings, etc., on a regular basis	41.5	83.3
enables its people to get needed information at any time quickly and easily	41.5	71.4
maintains an up-to-date database of employee skills	27.5	50.0
creates systems to measure gaps between current and expected performance	22.0	25.0
shares good-practices and lessons-learned among all employees	13.5	60.0
measures the results of the time and resources spent on learning	12.2	60.0
invites people to contribute to the organization's vision	38.0	83.3
gives people control over the resources they need to accomplish their work	20.0	57.1
considers the impact of decisions on employee morale	18.9	40.0
works together with the outside community to meet mutual needs	34.0	66.7
encourages people to get answers from across the organization when solving problems	31.4	71.4
leaders generally support requests for learning opportunities and training	34.7	80.0
leaders share up-to-date information with employees about competitors, industry trends, and organizational directions	30.2	20.0
leaders empower others to help carry out the organization's vision	19.2	60.0
leaders mentor and coach those they lead	28.8	40.0
leaders ensure that the organization's actions are consistent with its values	31.4	80.0

Table 70. Learning Practices in Use Combined with Age (Often/Always) (Population Analysis)

Learning practices in use combined with age Often/Always – Population (N) Analysis	N Range	N Average	% of total population
20-29 years of age	1	1.0	1.8
30-39 years of age	14-15	14.5	25.4
40-49 years of age	23-26	24.5	43.0
50-59 years of age	12-14	13.0	22.8
60+ years of age	3-5	4.0	7.0

Table 71. Learning Practices in Use Combined with Age (Often/Always)

Learning practices in use combined with age Often/Always	20-29 %	30-39 %	40-49 %	50-59 %	60+ %
Individual Level In the HEI employees:	8.3	26.4	27.1	36.0	65.8
openly discuss experiences in order to learn from them	0.0	13.3	38.5	53.8	60.0
identify skills needed for future work tasks	0.0	13.3	50.0	30.8	50.0
help each other learn	0.0	53.3	30.8	41.7	75.0
can get money and other resources to support their learning	0.0	20.0	12.0	7.7	75.0
can get time off to support learning	0.0	21.4	12.0	38.5	80.0
view problems and new directives as an opportunity to learn	0.0	21.4	19.2	23.1	75.0
are rewarded for learning	0.0	7.1	16.0	0.0	50.0
give open and honest feedback to each other	0.0	26.7	30.8	42.9	66.7
listen to others' views before speaking	0.0	40.0	23.1	35.7	66.7
are encouraged to state their opinion regardless of rank	0.0	26.7	30.8	46.2	75.0
treat each other with respect	100.0	53.3	42.3	61.5	50.0
spend time building trust with each other	0.0	20.0	19.2	50.0	66.7
Team or Group Level In the HEI teams/groups:	80.0	31.3	28.9	40.4	55.3
have the freedom to adapt their goals as needed	100.0	40.0	26.9	61.5	50.0
treat members as equals, regardless of rank, culture, or other differences	100.0	40.0	48.0	64.3	60.0
focus both on the group's task and on how well the group is working	100.0	26.7	28.0	33.3	66.7
revise their thinking as a result of group discussions or information collected	100.0	35.7	33.3	42.9	60.0
are rewarded for their achievements as a team/group	0.0	14.3	8.3	0.0	40.0
Organizational Level The HEI:	18.8	26.6	25.3	36.1	66.4
uses two-way communication, such as suggestion systems, electronic communication, open meetings, etc., on a regular basis	0.0	26.7	42.3	61.5	80.0
enables its people to get needed information at any time quickly and easily	0.0	40.0	38.5	50.0	80.0
maintains an up-to-date database of employee skills	0.0	28.6	24.0	30.8	66.7
creates systems to measure gaps between current and expected performance	0.0	14.3	26.1	15.4	50.0
shares good-practices and lessons-learned among all employees	0.0	20.0	12.0	15.4	50.0
measures the results of the time and resources spent on learning	0.0	20.0	17.4	8.3	25.0
invites people to contribute to the organization's vision	100.0	33.3	32.0	58.3	75.0
gives people control over the resources they need to accomplish their work	0.0	26.7	16.0	28.6	66.7
considers the impact of decisions on employee morale	0.0	20.0	8.0	23.1	80.0
works together with the outside community to meet mutual needs	0.0	40.0	30.8	41.7	66.7
encourages people to get answers from across the organization when solving problems	0.0	26.7	34.6	53.8	50.0
leaders generally support requests for learning opportunities and training	100.0	26.7	30.4	53.8	66.7
leaders share up-to-date information with employees about competitors, industry trends, and organizational directions	0.0	14.3	32.0	21.4	80.0
leaders empower others to help carry out the organization's vision	0.0	26.7	8.0	38.5	75.0
leaders mentor and coach those they lead	0.0	26.7	28.0	30.8	75.0
leaders ensure that the organization's actions are consistent with its values	100.0	35.7	24.0	46.2	75.0

Table 72. Learning Practices in Use Combined with Gender (Often/Always) (Population Analysis)

Learning practices in use combined with gender Often/Always – Population (N) Analysis	N Range	N Average	% of total population
Male	34-38	36.0	63.2
Female	19-23	21.0	36.8

Table 73. Learning Practices in Use Combined with Gender (Often/Always)

Learning practices in use combined with gender Often/Always	Male %	Female %
Individual Level In the HEI employees:	33.7	26.7
openly discuss experiences in order to learn from them	42.1	27.3
identify skills needed for future work tasks	42.1	23.8
help each other learn	41.7	40.9
can get money and other resources to support their learning	11.1	27.3
can get time off to support learning	29.7	19.0
view problems and new directives as an opportunity to learn	22.2	27.3
are rewarded for learning	13.9	9.5
give open and honest feedback to each other	38.9	26.1
listen to others' views before speaking	32.4	31.8
are encouraged to state their opinion regardless of rank	40.5	27.3
treat each other with respect	54.1	45.5
spend time building trust with each other	35.1	15.0
Team or Group Level In the HEI teams/groups:	34.9	35.3
have the freedom to adapt their goals as needed	45.9	31.8
treat members as equals, regardless of rank, culture, or other differences	56.8	43.5
focus both on the group's task and on how well the group is working	25.7	42.9
revise their thinking as a result of group discussions or information collected	35.1	47.6
are rewarded for their achievements as a team/group	10.8	10.5
Organizational Level The HEI:	33.5	26.2
uses two-way communication, such as suggestion systems, electronic communication, open meetings, etc., on a regular basis	52.6	31.8
enables its people to get needed information at any time quickly and easily	52.6	30.4
maintains an up-to-date database of employee skills	28.6	28.6
creates systems to measure gaps between current and expected performance	25.7	15.0
shares good-practices and lessons-learned among all employees	16.7	18.2
measures the results of the time and resources spent on learning	14.7	19.0
invites people to contribute to the organization's vision	44.4	38.1
gives people control over the resources they need to accomplish their work	27.8	18.2
considers the impact of decisions on employee morale	27.0	9.1
works together with the outside community to meet mutual needs	40.5	30.0
encourages people to get answers from across the organization when solving problems	40.5	31.8
leaders generally support requests for learning opportunities and training	35.3	42.9
leaders share up-to-date information with employees about competitors, industry trends, and organizational directions	35.1	18.2
leaders empower others to help carry out the organization's vision	25.0	22.7
leaders mentor and coach those they lead	33.3	27.3
leaders ensure that the organization's actions are consistent with its values	36.1	38.1

APPENDIX D: University Strategy (Corporate Plan 2010-11 to 2014-15)

Vision

The University of Nicosia aspires to be a leading contributor to excellence in education and research.

Mission

To help students become educated individuals, achieve their academic and professional goals and assume responsible roles in a changing world of European cooperation and global interdependence;

to promote research and the generation of knowledge; to be of service to society through the dissemination and application of knowledge, as well as through innovative partnerships with business and civic society institutions.

Values

The University's Values and Code of Practice have been codified after consultations at all levels. They are spelled out in the relevant booklet. They are also summarized below:

Summary Statement of Values:

To foster within the University community the values of personal and academic integrity, the liberty to question and to pursue knowledge, of respect for the laws of the Cyprus Republic, the European Union and the University, democratic governance and management of the institution, respect for persons, professionalism and diligence, ethical behaviour, civic responsibility, multi-cultural awareness, tolerance, and sustainability of resources.

The core values are:

1. Promoting **personal** and **academic integrity**
2. Cultivating, promoting, transmitting and exchanging **knowledge** and safeguarding **academic freedoms**
3. **Respect** for the University's **regulations,** as well as, the **laws** of the Republic of Cyprus and the European Union
4. Promoting and ensuring **democratic governance** and **management** of the University
5. Promoting high **standards of integrity** and **ethical behaviour**
6. Promoting **civic and social responsibility**

7. Promoting **tolerance**, **diversity** and **multi-cultural awareness**
8. **Efficient and sustainable use** of **resources**
9. **Personalised attention** and strong **student focus**
10. Promoting **entrepreneurship and innovation**

The above core values underpin the **Code of Practice** of the University, which attempts to translate the ethos entailed in the Values into general principles and guidelines.

Strategy

The strategy describes how the University will realise its vision.

It refers to the set of initiatives and activities, guided by the organisation's vision and values, which aim to provide the organisation with competitive advantage.

For a strategy to be focused, it needs to prioritize its aims, to determine the main "strategic pillars" or "key priorities", on which growth will depend.

For each such "pillar", the required "strategic objectives" should be specified.

Strategic Pillars

Eight (8) strategic pillars have been specified:

(1) High Quality Teaching and Learning

(2) Promoting Research, Knowledge Transfer, Innovation and Scholarship

(3) International Outlook

(4) Inclusive Access & Participation

(5) Service to Society

(6) Efficiency and Effectiveness

(7) Culture of Collegiality

(8) Financial Strength

Strategic Pillar 1. High Quality Teaching and Learning

Strategic Objectives

- Gradually evolve from a teacher-centered learning environment to a more student-centered learning environment.
- Continue to develop, refine and sustain the faculty's teaching/coaching skills
- Continuously monitor teaching / learning quality

- Enhance students' learning skills
- Keep improving learning and research resources
- Put in place adequate mechanisms for the continuous improvement of academic programmes – including ones for updating curricula.
- Ensure that the curriculum delves beyond technical skills and that it encourages more critical thinking and personality development
- Create and sustain a stimulating environment where students have ample opportunities to develop their interests, responsibilities and qualities of citizenship
- Encourage internships, practicums, and exchange programmes
- Support student involvement in creative extracurricular activities
- Develop Campus feel/life
- Introduce special topics/seminars in the curricula.

Strategic Pillar 2. Promoting Research, Knowledge Transfer, Innovation and Scholarship

Strategic Objectives

- Provide sufficient resources and a supportive environment for facilitating research (e.g. employ research assistants on a contractual basis, provide project management, legal and financial guidance etc.).
- Build research partnerships and links with other universities locally and abroad
- Enhance innovation, entrepreneurship, and industrial collaborations
- Encourage faculty to undertake consultancy
- Introduce postgraduate degrees through which research can be fostered
- Increase the proportion of graduate students
- Improve research governance structures aiming to further enhance the quality of research management within departments.

Strategic Pillar 3. International Outlook

Strategic Objectives

- Monitor global trends in university education (curricula, teaching methods, research directions etc.), so as to maintain practices acknowledged to be of sound international standards
- Foster multiculturalism as a central value of the university
- Continue to recruit a satisfactory proportion of international students
- Open up faculty positions to international applicants

- Encourage collaborative teaching and research programmes with reputable international institutions
- Encourage student exchange programmes – such as Erasmus, and special programmes (e.g. international summer schools)
- Expand the university's presence abroad, through DL programmes, franchise agreements, and local partnerships or branch campuses.

Strategic Pillar 4. Inclusive Access & Participation

Strategic Objectives

- Admission in most programmes to cater to the needs of all students who are able to demonstrate the potential to benefit from university study.
- Individual applicants to be considered on the basis of their merits, abilities and potential, regardless of race, ethnic origin, gender, gender identity, disability, or other irrelevant distinction.
- Further enhance IT facilities and services as well as the web-site and Intranet, to support e-inclusion
- Enhance support for students of a variety of abilities – including the services provided through the Academic Success Centre.
- Facilitate handicapped students through Counselling support, appropriate technology provision, special policies and arrangements which take their status into consideration, etc.
- Expand and promote Distance Learning programmes so as to reach students (locally and internationally) who cannot attend regular classes.
- Promote Life Long Learning and re-training opportunities

Strategic Pillar 5. Service to Society

Strategic Objectives

- Forge links between the university and the wider community aiming to put the institution's human and other resources to the service of the public and private sectors
- Encourage applied research, policy analysis and consultancy services by faculty
- Uphold corporate responsibility principles
- Promote the active involvement of Faculty, Students and Staff in communal activities
- Encourage faculty and students to engage with the promotion of humane values and civil and human rights
- Act as a forum for the discussion of important social and political issues
- Continue to financially support under-privileged students and other citizens.

Strategic Pillar 6. Efficiency and Effectiveness

Strategic Objectives

- Strive to adopt and maintain optimum management practices, including benchmarking
- Encourage decentralization, initiative and entrepreneurship
- Devolve more financial decision-making authority to the Schools and departments.
- Keep improving IT systems and MIS for increased management efficiency
- Develop and promote electronic services to students
- Aim at the more effective use of university resources (buildings, equipment, HR).

Strategic Pillar 7. Culture of Collegiality

Strategic Objective

- Ensure that the University maintains a people-oriented approach, giving high priority to the interests, needs, concerns, achievements and satisfaction of staff and faculty
- Facilitate effective two-way communication between administration and faculty
- Engage key faculty in the planning, budgeting, reporting and accountability procedures of the University
- Regularly monitor faculty and staff satisfaction, and implement follow up action plans.

Strategic Pillar 8. Financial Strength

Strategic Objective

- Ensure the financial viability and profitability of operations
- Increase the productive efficiency of faculty and facilities
- Ensure availability of cash for current obligations
- Plan capital investment (buildings, equipment) for future growth
- Plan appropriate financial structuring (limit liability, obtain low cost financing etc.)

APPENDIX E: University IT Strategy (Draft – 2002)

IT Strategy

Intercollege (now University of Nicosia)

1. Introduction

Information Technology plays a vital role in the teaching and learning, research, administration and management of Intercollege. It is therefore of paramount importance that an Information Technology (IT) Strategy exists and becomes an integral part of the Intercollege general Strategy.

An IT Strategy should guide the development of a well-found information environment in order to deliver convenient access to information, improve communication, collaboration and learning and ensure a flexible, responsive and above all reliable system. This system should

- support teaching and learning to be both effective, efficient and of the highest quality
- provide research with the highest quality support
- provide access to electronic sources of scholarly information and a forum for scholarly debate
- enable all College units to function effectively
- provide effective, efficient and reliable administrative support to students, staff and faculty
- provide support at the operational, middle management and executive level functioning of the College in terms of providing information, automating tasks and enabling and automating decision making
- implement to the highest possible extent a “paperless office” business environment
- provide the required infrastructure and the human resources expertise for providing services to community and consultancy work to industry.

When implementing an IT strategy in an organization, it is very important to know that IT automation is not just the implementation or re-implementation of existing manual or automated processes in a new IT environment. The introduction of new Information Systems gives a good chance to the organization to re-examine the way it does business and the way its processing functions. Having this in mind, an IT strategy should consider very seriously the re-engineering of the business processes and the way the organization functions.

Finally, it is of paramount importance to realize that the IT infrastructure (state-of-the-art hardware and software as well as human expertise) of an organization and the maintenance of Information Systems constitutes a very big expense and requires the full commitment of the

organization. The College has to understand that in order to survive and gain a competitive advantage, it should not hesitate to invest heavily in IT. Finally, it is also important to realize that it is not responsible to budget for IT in an ad hoc manner and fund it on a crisis basis. Funding for IT requires good planning and should be done according to the strategy approved.

2. IT Strategy Committee

For the development, implementation, monitoring, review and changes of the IT Strategy, an IT Strategy Committee (ITSC) should be composed. The committee should report to the Council of the College and should be composed of people from all the levels of the organization, including students, faculty and staff members. The following composition is recommended:

- Director of the MIS Centre (See Section 3) – Chair	(1)
- 1 representative from the Council	(1)
- 1 representative from the Senate	(2)
- 1 faculty representative from each School Council	(4)
- 2 staff representatives	(2)
- 1 student representative	(1)
- Heads of Admissions, Academic Affairs, Student Affairs and Finance Departments	(4)
- Heads of Professional Programs	(2)
- Director of Research Foundation (not an approved body)	(1)
	(18)

3. MIS Centre

In order for the IT Strategy of the College to be developed, implemented, monitored and utilized, it is of paramount importance that a healthy MIS Centre exists. This requires the following:

- A well defined structure of the MIS Centre
- A clear division of Units led by qualified and experienced Unit leaders/managers
    - Software Development
    - User-Support and Help Desk
    - Teaching and Learning Information Technology
    - Internet, Intranet and CD ROM Productions
    - System Administration
- A chief Executive MIS Director, reporting to top management and being a member of the College's Council
- An IT Strategy of the Centre to be developed
- Commitment to the employment of the required IT infrastructure (state-of-the-art hardware and software and highly IT expertise staff)

- A more than an adequate number of specialized IT people staffing the MIS Centre
- A commitment to offering competitive salaries to specialized IT staff
- IT specialists to be trained in most parts, duties and jobs of the MIS Centre so that contingency human resource measures exist
- In-house software development to be well documented according to standard software development methodologies
- Any activity of the MIS Centre to be carried out based on universally accepted standards.

4. Aims of the IT Strategy

The main aims of the IT strategy can be broken down into the following categories:

- Teaching and Learning
- Research
- Faculty Support
- Distance Learning
- Staff Support
- Centralized Repository of Intercollege Data
- Student Administrative/Services
- User Support
- Innovation
- Ethical Issues, Intellectual Property, Privacy and Security of Data and Information

4.1 Teaching and Learning

As teaching is the primary goal of Intercollege, IT support is essential for the creation of a high quality teaching and learning environment for the students. Such an environment will

- enhance the students teaching and learning skills and capabilities
- help students learn how to learn, become active learners and prepare them for life-long learning
- enhance the "technology literacy" of students and prepare them for life in the information age
- help students achieve their educational aims.

It is also important to realize the value-added importance of such a high quality environment in our advertising campaign and recruitment efforts for attracting students (but also qualified faculty). In order to achieve this high quality teaching and learning environment the following recommendations are made:

- Provide state-of-the-art teaching and learning facilities

- Learning Resource Centre(s) equipped with computers and providing access to multimedia learning resources on a 24-hours basis, 7 days as week.
- State-of-the-art multimedia labs operating on a 24-hours basis
- Fast access to the Internet in all the labs
- "Smart" classes - (networked) multimedia computer facilities, internet connection and modern audio-visual equipment in most classes
- Laptops for faculty to take home/conferences when traveling

- Maintain a Virtual Library and provide state-of-the-art Library facilities
  - On-line access to research databases (journals/magazines/etc.)
  - CD ROM databases of information
  - A sufficient amount of computers for students
  - On-line access to other libraries
- Provide support for the delivery of IT-based supporting educational material and purely distance-learning educational material through
  - The establishment of a Teaching and Learning Information Technology (TLIT) Unit and the availability of the necessary infrastructure
    - Hardware
    - Software
    - Human resources (specialized IT staff)
  - Provision of training seminars and end user support for developing open and distance learning educational material.
- Provide support for learning English through
  - Specialized multi-purpose laboratories
  - Access to electronic multimedia interactive resources

4.2 Research

Research is becoming a major part of the faculty and College activities. An academic institution, in order to be competitive, must be engaged in serious research work. Research work is tightly coupled with teaching and every faculty member is/will be expected to carried out research and bring into class the knowledge gained from his/her work. To this end, the following recommendations are made for the support of the College's research activities:

- Provide state-of-the art computer facilities to every researcher (individual or unit)
- Provide fast access to Internet to every researcher
- Provide on-line research databases through the Library
- Allow a budget for every researcher for individual on-line memberships to specialized research databases
- Provide training on the use of Internet and on-line access of information

- Develop a database of web sites related to research grant opportunities
- Develop a database of the research work carried out at the College so that
    - faculty members are informed about their colleagues work and thus be able to seek research collaborations
    - allow researchers from other universities in the world to access through the Web the database and seek collaborations
    - produce annual statistical reports; such reports are needed by the government but they can also be used for advertising reasons

4.3 Faculty Support

Teaching and Research are the primary responsibilities of faculty members. Additionally, faculty members carry out some administrative tasks related to these activities (e.g. calculation and reporting of grades, maintenance of student assessment records, student advising, etc.). To this end, the following recommendations are made for the effective and efficient completion of the faculty members' duties:

- Provide support for research as stated in Research Support
- Provide support for teaching and learning as stated in Teaching and Learning Support
- Provide faculty development support in the use of modern state-of-the-art technology and software for improved productivity
- Provide faculty with continuous IT training
- Provide IT supporting tools for on-line authorized access to students' data, electronic forms and electronic submission of data.

4.4 Distance Learning

Distance learning and the delivery of distance-learning programs should be seriously considered by the College. The support of IT in the delivery of such programs is crucial to their success. The recently established Distance Learning Office of the College is currently engaged in more traditional distance-learning activities and provision of traditional distance-learning programs offered by other universities. If the College wishes to offer its own distance-learning programs over the Internet, then this cannot be done without the active involvement of the TLIT Unit (proposed in the MIS centre structure - Section 3).

4.5 Staff Support

Nearly every staff member of Intercollege has a computer on his/her desk and performs most of his/her job tasks using computer applications (in-house developed customized software - Exelixis system or off-the-shelf packages - Microsoft Office for improving personal productivity). It is of paramount importance that IT skills are cultivated and enhanced continuously. It should also be

stressed out that staff at all levels (from the lowest operational to the highest executive) should be able to use efficiently and effectively IT. To this end, the following recommendations are made:

- Excellent IT skills are part of the job description of every staff member
- Provide an IT training as part of all new staff induction
- Encourage staff to achieve a high level of IT competence
- Provide staff with continuous IT training at basic and advanced levels
- Provide staff with supporting training in internationally recognized IT qualifications (e.g. European Driving License).

4.6 Centralized Repository of Intercollege Data

Data in the modern information age is the most important asset of an organization. It is therefore important that Intercollege Data is kept secured, correct, and safe. Information Systems qualities include correctness, reliability, robustness and efficiency. A basic requirement of Information Systems is that data should be recorded only once. Duplication of data results in greater effort for updates and may also result in inconsistencies. It is therefore of paramount importance that all Intercollege Data resides in a centralized Information System implemented with the right levels of authorization and security and read/write access privileges. The system will allow shared access to the data and the information produced. This will enable all people at the College (students, staff and faculty) to have direct access to authorized up-to-date information.

4.7 Student Administrative Services

Students interact with the various administrative departments of the College on a daily basis requesting various administrative services. It is of paramount importance that the service they get is equally effective and efficient as the teaching and learning services. In a competitive environment at the national and international arena, the quality of student services and the "customer" satisfaction level become key factors in the retention and recruitment of students and the growth of the institution. The College considers the human factor and the customer service by staff as of paramount importance. Equally important is the utilization of IT in the delivery of quality service. To this end, the following recommendations are made for the employment and utilization of IT:

- Re-engineer business transactions and services to students
- Provide support for paperless transactions
- Provide on-line access to personal and non-personal information via the Internet and the Intranet of the College
- Eliminate bureaucratic transactions
- Eliminate the need for approval/signatures from many offices
- Eliminate queues outside service officers.

4.8 User Support

The efficient and effective running of an Information System and IT applications depends heavily on the efficient and effective use of the system by its users. User support is very important in this respect. Users need access to manuals, continuous training and require troubleshooting solutions to ad-hoc problems. It is therefore of paramount importance that a Help Desk Unit (as proposed in Section 3 in the MIS Centre) is established and well staffed with specialists in end-user support. To this end, the following recommendations are made:

- Create and staff a Help Desk Unit and assign a Unit leader manager. This unit will
    - Provide support and troubleshooting solutions to ad-hoc user problems
    - Provide regular training IT seminars to users
    - Develop and distribute on-line and hard copies manuals
    - Prepare and distribute regular circulars informing users on developments on IT, changes to existing software used and new software acquired
    - Keep informing users on new development in Information Technology and the way it affects our work and life.

4.9 Innovation

The use of IT at the operational, middle management and executive level for the automation of tasks and the enabling and automating of decision making as well as for the support in teaching and learning, research and administration of the College, is expected to contribute considerably to the growth of the College. However, IT should not only be seen as a supporting tool in the functioning of an Organization. IT can be a strategic weapon that can differentiate an organization form its competitors. In the case of Intercollege, it has already been mentioned how the quality of service to students, the enhancement of the teaching and learning environment, innovative teaching and learning facilities and the delivery of distance-learning education can improve the goodwill of the College and help retention and recruitment of students, thus contributing considerably to the growth of the College. The MIS centre, and especially the MIS Executive Director, should always be alert on how to utilize IT within the College and/or outside the College (e.g. providing outsourcing of infrastructure and services, production of advertising electronic material and CD ROMS, establishment of Internet Cafe, etc.) in order to help the College to grow more. To this end, it is expected that the MIS Executive Director will not be just a good manager but a person that comes up with innovative ideas.

4.10 Ethical Issues, Intellectual Property, Privacy and Security of Data and Information

The availability and access of shared data and information poses ethical concerns. Private and confidential data should be kept secured and not be access by unauthorized users. Security,

robustness and reliability of Information Systems are also extremely important. To this end, the following recommendations are made:

- Inform and educate users regarding the confidentiality and privacy of data and information
- Inform and educate users regarding the legislation related to the above issues
- Inform and educate users regarding the regulations related to intellectual property
- Produce internal rules and regulations complying with the existing legislation, regarding confidentiality, privacy, security of data
- Design, document and implement physical and logical security mechanisms for the hardware, software, data and information
- Design, document and implement procedures and rules for the security, consistency, availability, recovery of data and information
- Design and document contingency plans
- Design, document and implement testing and auditing procedures.

Conclusions

Data and Information is today the most valuable asset of an organization. We are living in the information age and IT plays a crucial role in the success of any organization. Here at Intercollege, we have to realize the importance of IT and commit ourselves to provide all the necessary funds for implementing our IT strategy.

The recommendations made herein are general descriptions and need further elicitation and expansion. This makes absolutely necessary the urgent formation of the IT Strategy Committee (ITSC), the appointment (internal or external) of an Executive MIS Director and the restructuring of the existing MIS Centre. The ITSC working closely with the MIS Centre will then have the responsibility of implementing Intercollege IT Strategy.

APPENDIX F: Review of Content Management Systems (CMS)

In **Invalid source specified.** there is a long listing of CMSs some of which are open-source software, some are available as Software as a Service (SaaS) and some are proprietary software. Most of these software systems are capable of web content management (WCMS), group content management (GCMS), and enterprise content management (ECMS). Proprietary CMSs are also described on the website in terms of platform and database supported.

Idealware published a market analysis between nonprofit organizations on the popularity of open source CMS for the creation and management of their Web sites. Their analysis produced the following ranking of open CMSs popularity **Invalid source specified.**:

Table 74 CMS Popularity (Source: idealware, 2012)

Rank	Application	Weighted Score
1	Joomla	6.75
2	WordPress	5.86
3	Drupal	1.09
4	Plone	0.83
5	eZ Publish	0.36
6	DotNetNuke	0.34
7	Movable Type	0.25
8	Magnolia	0.15
9	OpenCMS	0.12
10	Xoops	0.07
11	Typo 3	0.05
12	MODx	0.02
13	Impress CMS	0.02
14	Hippo	0.02

The table which follows presents a summary of the suggestions made by idealware in a 2013 report (idealware, 2013):

Table 75. idealware Suggestions; Source: idealware, 2013

Evaluation Criteria	Suggested Open-Source CMS	Suggested Proprietary CMS
Ease of Setup	WordPress	SquareSpace
Power and Flexibility	Plone	Ektron
Integrating with Constituent Data		NetCommunity, Luminate CMS

Other factors which could be considered as evaluation criteria involve cost, extensibility, and system support. Idealware suggest as “good middle-of-the-road options” WordPress, Joomla,

DotNetNuke, Drupal, eZ Publish, and Plone from the open-source CMS category and ExpressionEngine from the proprietary software.

A search for CMSs working on a Microsoft platform revealed:

Table 76. Open-source CMSs Supporting the ASP.NET Platform; Source: Wikipedia, 2012

Microsoft ASP.NET [edit]

Name	Platform	Supported databases	Latest stable release	Licenses	Latest release date
Composite C1	ASP.NET (Web Forms, MVC)	XML, SQL Server	4.2.1	Mozilla Public License	2014-06-23[3]
DotNetNuke	ASP.NET (Web Forms)	SQL Server	7.3.2	MIT License	2014-08-14[4]
mojoPortal	ASP.NET	SQL Server, MySQL, PostgreSQL, SQLite, Firebird, SQL CE	2.4.0.4	CPL	2014-07-18[5]
Orchard Project	ASP.NET (MVC)	SQL Server, SQLCE, MySQL, SQLite, PostgreSQL[6]	1.8	New BSD License	2013-11-19[7]
Umbraco	ASP.NET (Web Forms, MVC)	SQL Server, MySQL	7.1.8	MIT License	2014-10-08[8]

A general search for open-source CMSs supporting the Oracle database revealed mostly Java platform CMSs and a few of other platform systems but no Microsoft platform CMS.

Also from the proprietary software Alterian CME, Contegro, DotNetNuke, Ektron CMS, EPiServer CMS, Kentico CMS, Open Text Web Site Management, SharePoint, Sitecore, Sitekit CMS, Telligent Community, Titan CMS and Webnodes CMS work on the Microsoft ASP.NET platform. Between them Alterian CME and Sitecore additionally support the Oracle database. Some more CMS use a certain .NET platform and between them a couple also support Oracle.

Thus, upon consideration of the results of the above search into CMS and the pre-specified selection criteria, two software systems were shortlisted. These are DotNetNuke and SharePoint. The justification for their selection was that:

DotNetNuke (DNN)

DotNetNuke (DNN) (DotNetNuke, 2014) was selected as an open-source CMS based on Microsoft.NET. Written in VB.NET and later on C# and running on the ASP.NET platform, DNN is fully compatible with Microsoft products. DNN Community Edition is distributed as an open-source free version under an MIT license but the product also has a commercial proprietary license for a Professional and an Enterprise Edition. Technical support and increased functionality are offered with the two commercial licenses of the product which have been renamed as of July 2013 to Evoq Content. Evoq Content includes besides CMS features, workflow, extensibility via Application Programming Interfaces (API's) and third party modules, mobile CMS device support, eCommerce capabilities, and more. The appearance of websites can be customized using skins. Special attention has been given by the developers to security and Evoq Content provides for website security, active directory authentication, granular permissions, and application integrity control features.

The default functionality of any DNN edition can be expanded either by adding third-party modules selected from a library of available modules or by developing in-house additional custom

functionality. As with modules, skins can be uploaded and automatically installed to customize the appearance of the websites.

Besides the support and updates offered for the commercial editions of DNN, the free community edition is followed by a big crowd of registered members and developers and as a result newer editions of the software are released regularly. An API reference document is available and a growing Wiki (www.dnnsoftware.com/wiki) with 400 plus wiki pages offer documentation and support in users' efforts to fully explore DNN capabilities.

Cases of successful implementations of DNN by commercial clients are reported on the DNN website (DotNetNuke, 2014). Amongst them are a few academic institutions:

- Cornell University, Johnson Graduate School – Used Evoq Content to create a streamlined site. With DNN tools and modules, they built a visually rich, easy-to-navigate site that includes a compelling, external-facing web site and a new intranet for students to improve employment prospects by communicating and collaborating with alumni.
- University of New Orleans - Deployed the cost-effective DNN Web CMS, which provides powerful content management tools and supports hundreds of sub-sites used by UNO colleges and departments.
- SchoolDude – Using Evoq Social increased engagement with existing customers and generated awareness to an entire universe of potential new customers through its existing website. The result was an increase in website engagement metrics by 35 – 54%.

A number of websites comparing DNN to other CMS such as WordPress, Joomla, and Drupal which are higher up in popularity (idealware, 2013) are available.

Microsoft SharePoint

MS SharePoint is an integrated suite of collaboration and content management capabilities that organizations can use for information sharing across organizational boundaries to increase the efficiency of business processes. Administrators can configure secure environments to provide personalized access to documents and other information with extensive search features which enable users to find content efficiently (Microsoft, 2014). SharePoint is also a web application framework and platform which integrates intranet, content management including document and file management, collaboration, social networks, extranets, websites, enterprise search, and business intelligence components. SharePoint comprises a suite of software components which offer all of these functionalities. SharePoint can be downloaded and used for free but most of the add-on packages which work with it have a cost. These include the SharePoint Server which is a set of extended functions to SharePoint. Additional functionality can also be built in house or purchased from other vendors, not just Microsoft. SharePoint is also accessible through Office

365 Enterprise, the subscription-based software (SaaS) and services package that includes Microsoft Office applications and hosted versions of Microsoft's Exchange Server, Lync Server, and SharePoint Server. Office web applications which are web-based, online, cross-browser compatible versions of popular Office applications can integrate directly into SharePoint's document management functionality.

SharePoint can in fact extend to a lot of business areas. For example through Business Process Automation (BPA) SharePoint can get mobile Customer Relationship Management (CRM) functionality and combined with xRM it may offer embedded document repositories, portal integration, enterprise search, and dashboards.

SharePoint is commendable for offering a varied collaboration enabling environment and in its latest version (SharePoint 2013) also includes social features (My Sites) such as a microblogging component with popular social tools, community sites which offer for discussion forums, your contact information (People Card) with additional options, cloud storage with synchronizing (SkyDrive Pro), social software in the workplace (Yammer), etc.

The functionality of SharePoint has also been reviewed in Appendix A.

SharePoint Case Studies Reviewed

A number of case studies were reviewed to consider the experiences of other educational institutions with the SharePoint platform (Microsoft, 2014). Here are a few:

- University of Graz – In 2013 launched a new intranet to enable better research collaboration and administrative efficiencies. Employees use the social media features built into Microsoft SharePoint Server 2013 to share expertise more easily and the powerful search engine to find information quickly.
- University of Nottingham Malaysia Campus – Uses SharePoint as a platform for content management and team collaboration, but also for connecting line-of-business systems to improve visibility, communication, and productivity across the organization.
- ESADE (In the top 20 global business schools in the world) - ESADE directors are aware of the importance of innovation, access to information, and collaboration in the field of education, thus, they decided to use MS SharePoint Server 2010 to implement a new intranet which allows employees to benefit from improved collaboration and efficiency.
- University of Colorado Denver, Anschutz Medical Campus - With no effective governance of its web presence, the university suffered from a diluted brand, unpredictable navigation, inaccurate information, poor web analytics, and low search rankings. The university consolidated its web presence onto Microsoft SharePoint Server 2010, and now has a consistent, dynamic web presence that promotes it as a leading university.

Thousands of people can contribute content but the IT effort required for common website updates and system administration tasks has decreased by up to 90 percent.

- Holy Spirit University of Kaslik (USEK) – Implemented MS SharePoint Server 2010 Enterprise to improve communication and collaboration between its five campuses. The resulting system improved the flow of information, while cutting administrative tasks and increasing productivity.
- Davidson College – Invested in a Microsoft Enterprise Client Access License Suite agreement. Used MS SharePoint Server 2007 for collaboration and improved access to college services. Added new portal functionality, which provides a single source for budgetary and logistical information, as well as committee collaboration for staff and faculty. Also used Microsoft Exchange Server 2010 to provide greater parity between the PC and Macintosh users, and Microsoft System Centre Configuration Manager 2007 to reduce the IT support burden.

A number of HEI also use MS SharePoint as a Learning Management System (LMS). Cases of such HEI include:

- Hellenic American Educational Foundation - Created a Learning Gateway on Microsoft Office SharePoint Server 2007 Enterprise Edition between two campuses. The resulting digital community links teachers and students from grades 1 to 12 with each other by providing all the resources they need to collaborate and communicate.
- CROC for Russian Universities - CROC, a Microsoft Gold Certified Partner, helps Russian Universities to build portals based on Microsoft Office SharePoint Server 2007 they then use to provide high-quality learning materials, improve teacher productivity, and automate interactions between headquarters and regional branches.
- Competentum – The company provides turnkey technology solutions for online education and training. Its product, ShareKnowledge, based on Microsoft Office SharePoint Server 2007 is as a complete solution for creating and managing rich, collaborative online learning environments.
- MT & M College (Private Bulgarian College) - Deployed Microsoft Office 365, and particularly Microsoft SharePoint Server 2010 as its new Learning Management System (LMS).

Other uses of SharePoint:

- Technische Universität München – Used Microsoft Office 365 for education. Through it each account has 25 gigabytes of online email storage, and with access to Microsoft SharePoint Online the Institute began collaborating in the cloud—at any time, from anywhere, and from any device.

The multi-facet of functionalities offered by the integrated tools of the MS SharePoint environment and its multiple add-on software modules as well as the many successful implementations in educational organizations created a strong momentum in favor of SharePoint and led to its selection as the preferred software platform for the Senate KM implementation.

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